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DESCRIPTIVE LIST

OF

TREES, SHRUBS, CLIMBERS

AND

ECONOMIC HERBS

OF THE

NORTHERN & BERAR FOREST CIRCLES

CENTRAL PROVINCES

BY

D. O. WITT

Dy. Conservator of Forests

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PREFACE.

This list has been prepared at the instance of Government, on lines laid down by Mr. R. S. Hole, Forest Botanist, in a note published as Forest Bulletin No. 23 of 1913.

It was originally intended that a separate list should be prepared for each Forest circle, but owing to the transfer of Mr. J. Donald (who had been entrusted with the preparation of the list for the Berar Circle) to Dehra Dun, I was asked to prepare a combined list for the Northern and Berar Circles. My original list for the Berar Circle published in 1908 had been considerably added to by Mr. J. Donald, who kindly put his notes at my disposal, for which my thanks are due. Considerable assistance has been given me by Divisional Forest Officers, who have supplied lists of species with local vernacular names, and have assisted my collectors, or sent in collections of their own. My special thanks in this respect are due to Messrs. Kenny, Mason, Hunt, and Peake.

I am further deeply indebted to Mr. R. S. Hole, Forest Botanist, who has not only aided with suggestions, but who has examined many doubtful species, and has cleared up more than one case of mistaken identity, and given me valuable assistance when examining the Herbarium at Dehra Dun. So far as the number of species dealt with in this list are concerned it is thought that it is fairly complete, but there is still much work to be done with regard to the distribution of species, more especially amongst the shrubs and climbers. It is hoped that the accompanying keys will make identification of the less well-known species comparatively easy, and so add to our knowledge of their distribution.

Finally I should note that all specimens collected by myself or received from other Forest Officers in the course of preparing this list have been deposited in the Forest Herbarium at Dehra Dun where they are on permanent record.

PACHMARHI :
10*th June* 1916.

D. O. WITT,
Deputy Conservator of Forests.

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INTRODUCTION.

Area.

The area embraced by this list consists of the Northern and Berar Forest Circles of the Central Provinces. It is situated between 24° 30′ and 19° 35′ north latitude and 81° 40′ and 75° 50′ east longitude and includes about two-thirds of the Central Provinces with an area of 55,042 sq. miles embracing the whole of Berar and the following ten Civil Districts of the C. P., *viz.*, Saugor, Damoh, Jubbulpore, Mandla, Seoni, Chindwara, Narsinghpur, Hoshangabad, Betul and Nimar. The Forest Divisions referred to in the list correspond with few exceptions to the Civil Districts.

A glance at a map will show that the extreme northern and extreme western portions of the Province, bordering respectively on the U. P. and Bombay Presidency fall within the area, while on the south the limits extend to the borders of the Nizam's Dominions.

Botanical region.

Botanically this area falls within the so-called Western Peninsula, one of the three primary Divisions into which British India has been divided by Sir J. D. Hooker. These three botanical areas are further divided into nine botanical Regions, the one we are here concerned with being the Deccan in a very broad sense. This is again divisible into four Sub-regions, one of which includes the upper valleys of the Nerbudda, Tapti, Mahanadi, and Godaveri rivers, belonging for the greater part to the political Provinces of Bombay, Central India, the C. P., Berar, Chota Nagpur and Orissa. The area here dealt with lies in this Sub-region. For further details in this connection, reference may be made to "A Sketch of the Flora of British India" by Sir J. D. Hooker.

Physical features.

The main physical features of this area consist of (1) two narrow valleys, the upper waters of the Nerbudda and Tapti rivers, running almost due west, flanked on both banks by a rugged mass of hills forming two definite mountain ranges. Of these rivers the Nerbudda lies to the north.

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(2) A broad and fertile plain, in the political area of Berar, lying south of the range flanking the Tapti river on its left and therefore southern bank. Through the centre of this plain runs the Purna river which joins the Tapti a short distance beyond the western boundary of the Province.

(3) A range of low hills, the Ajanta hills running east and west, to the south of the Berar plain.

Taking these main features in greater detail, and starting in the north, first comes the range known as the Vindhyan hills separating the Gangetic basin from the Deccan, and forming a well marked chain across the centre of India. The Vindhyas do not form a range of hills in the proper geological sense of the term, but together with their eastern continuation, the Kaimur Range, are merely the southern scarps of the plateau comprising the country known as Malwa and Bundelkhand. The Saugor and Damoh districts lie on this plateau at an average elevation of 1,500 to 2,000 feet. The surface of the country is undulating and broken by frequent low hills usually with flat tops, and clothed with deciduous forest in which Teak is often predominent. The general slope is to the north, the rivers of this area being tributaries of the Jumna and Ganges.

At Amarkantak, the most eastern point of our area, the Vindhyas touch the second of the two mountain ranges, at the source of the Nerbudda. This mountain range is known as the Satpuras, and is separated from the Vindhyas by the valley of the Nerbudda with an average width of 20 miles. From Amarkantak the Satpuras extend from east to west for about 600 miles and in their greatest width where they stretch down into Berar exceed 100 miles from N. to S. Starting as a broad tableland the range shrinks as it proceeds westward into two parallel ridges, ending so far as the C. P. is concerned at the famous hill fortress of Asirgarh, and bounding on either side the narrow valley of the Tapti river which has its source in Betul.

Portions of the Satpura plateau consist, as in Mandla and Chindwara, of a rugged mass of hills hurled together by volcanic action. But the greater part is an undulating tableland, a succession of bare stony ridges and narrow fertile valleys. Scattered over the plateau isolated flat-topped hills rise abruptly from the plain.

The general height of the plateau is 2,000 feet but a number of small tablelands lie among the hills at a greater height, the most important of which are Pachmarhi (3,530 feet) and Chikalda in Berar (3,664 feet), while several peaks are over 4,000 feet, the highest point in the range being Dhupgarh (4,454 feet).

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South of the Berar plain the Ajanta hills (the Balaghat) running east and west constitute the southern limits of the area. These hills form a tableland of only moderate elevation, the highest point being only 2,190 feet. It stretches in points into downs and dales, or is broken into flat-topped hills and deep ravines, more especially in its eastern section in the Yeotmal Division.

Geology and Soil.

Six geological formations are represented in this area, *viz.*, (1) Alluvium, (2) Deccan trap, (3) the Gondwana system, (4) the Vindhyan system, (5) the Transition system, (6) the Gneissic system.

Alluvium.

This system occupies the greater portion of the valley of the Nerbudda, in the Jubbulpore-Narsinghpur and Hoshangabad Divisions, and is chiefly composed of a stiff reddish or yellowish clay with intercalated bands of sand and gravel. The valley of the Purna in Berar is similarly covered with alluvium.

With this system must be included the Laterite formation. This may exist as definite strata as in some irregular patches in the north of the Jubbulpore district, but more often it constitutes the overlying soil, a lateritic murram, common in the N. and S. Mandla Divisions, and also in the Hoshangabad and Seoni Divisions, frequently as a capping to trap hills.

Deccan Trap.

The basaltic or volcanic rocks known as Deccan trap cover the major portion of the area, occupying the greater part of the Saugor, Jubbulpore (excluding Narsinghpur), N. and S. Mandla, Seoni, and Chindwara Divisions, the Rahatgaon and Magardha ranges of the Hoshangabad Division, and all the Berar Circle Divisions with the exception of the eastern portions of the Yeotmal Division, the northern portion of the Betul Division, and a strip along the Nerbudda in Nimar The region covered by these volcanic rocks consists usually of undulating plains, divided from each other by ranges of flat-topped hills. The hillsides are marked by conspicuous terraces due to the outcrop of the harder basaltic strata, better able to resist disintegration. Throughout this tract we find black-cotton soil, which is believed to have been formed by the denudation of basalt rock combined with decomposed vegetable matter.

Gondwana formations.

These are chiefly composed of sandstones and shales, apparently deposited in fresh water. As a general rule these rocks occupy basin-shaped depressions in the older formations, sometimes corresponding to the existing river valleys. The main areas of Gondwana rocks are in the Satpura Range, and include the Pachmarhi and

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Mahadeo hills in the Hoshangabad Division, the hills in the north of the Betul and Chindwara Divisions, an irregular broken strip running past Jubbulpore in a N. E. direction, and some larger masses on the east and north-eastern border of the Jubbulpore-Narsinghpur Division. A corner in the east of the Yeotmal Division in the Ajanta hills is also occupied by this formation. In the Pachmarhi hills these rocks consist chiefly of beds of coarse sandstone and conglomerates. They form high ranges of hills and often weather into vertical scarps of great height, making conspicuous cliffs in the forest clad hills.

The Vindhyan system.

This consists principally of sandstones, shales and limestones, and is divided into the Upper and Lower Vindhyans. The Upper Vindhyan rocks appear over a considerable area of the Saugor Division chiefly in the north and east, while to the south-east Lameta limestone is largely developed. Practically the whole of the Damoh Division is on Vindhyan sandstone with alternations of shale. The limestone element is deficient. The Kaimur Range with its knife edge ridge, forming the boundary between the Damoh and Jubbulpore districts on the west, consists of massive sandstones of the Upper Vindhyan series, upheaved into an almost vertical position. Practically the whole of the north-western frontier of the Jubbulpore district is occupied by Upper Vindhyans, while Lower Vindhyans form a strip along the north-eastern boundary. The same system appears in the Chandgarh and Punasa ranges of the Nimar Division, along the Nerbudda, where there are also outcrops of granite, schists and limestone.

In Berar there is a group of rocks known as Purana which corresponds to the Vindhyans in Saugor and Damoh. They come to the surface on the south-eastern margin of the great cap of Deccan trap. Consisting of shales and sandstones frequently changed to quartzite and limestones, they are covered with two small outlying patches of Deccan trap south-east of Kayar in the south-eastern corner of the Yeotmal Division, and with some outliers of Gondwana beds farther west.

Transition system.

The transition or sub-metamorphic formation, also known as Bijawars, is somewhat earlier than the Lower Vindhyans. Rocks belonging to this system consisting of quartzite, hornstone breccia and limestone occur in the western portion of the Hoshangabad Division, and again in the north and centre of the Jubbulpore-Narsinghpur Division, and the hilly portions to the south-west in the Narsinghpur district. They again appear and occupy considerable areas in S. Mandla Division, more especially, in the Bunjar and Motinala ranges, but they are not exposed over any wide area being almost everywhere overlaid by trap which is the uppermost rock.

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Those formations occur for the most part in the plateaux districts.

Gneissic or Metamorphic rocks.

The rocks consist of gneiss, granite and syenite, sometimes of fine, sometimes of coarse texture. The chief areas occur in the south-east of the Jubbulpore-Narsinghpur Division immediately south of Jubbulpore; a considerable portion of the Chindwara Division particularly along the valley of the Kauhan river and to the west of Chindwara; the south and south-eastern portions of the Seoni Division; the hills in the Ranipur Range of the Betul Division, stretching across to the N. of the Civil Station of Badnur; a portion of the Banda Range in the extreme north-eastern corner of the Saugor Division. In the last case the formation is part of the Bundelkhand gneiss. The crystalline rocks of the Bunjar and Motinala ranges of the S. Mandla Division have been mentioned under the Transition system, but more highly crystallised rocks are also met with which are of older origin, and therefore belong more properly to the gneissic system.

Climate and temperature.

As regards climate the area may be divided into two main divisions. Saugor and Damoh on the Vindhyan plateau, Jubbulpore at the head of the Nerbudda valley, Mandla, Seoni, Betul, Chindwara, part of Hoshangabad and the Melghat on the Satpura uplands enjoy a distinctly lower average temperature than the rest of the area.

This difference is due partly to elevation and partly to the fact that the northern districts receive the westerly winds which blow across Northern India during the dry season. The advantage in favour of the northern districts varies from 3° in the hot weather months to 7° in the winter months. Slight frosts frequently occur in the plateau districts in December and January but are practically unknown in the rest of the area.

Rainfall.

The annual rainfall of the area averages 47 inches varying from 32 inches in Nimar to 59 inches in Hoshangabad. The plateau districts not unnaturally record the highest rainfall, the average for these districts being 52 inches as opposed to 33 inches in Berar. Pachmarhi with 77 inches has the highest individual record.

Types of forest.

The forest vegetation of this area all belongs to the great dry deciduous belt occupying a large part of peninsula India, extending north into the United Provinces, south into Madras, east into Chota Nagpur and Orissa, west into Khandesh.

Broadly speaking there are four main types of forest represented in this area, *viz.*, I. Mixed Teak forest; II. Salai forest; III. Anjan forest; IV. Sal forest.

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The first of these, *i.e.*, Mixed Teak forest, may be conveniently sub-divided into (*a*) Plain forest on alluvial and dry shallow soil; (*b*) Mixed Teak forest on well drained slopes and in valleys.

These four types may be briefly described as under :—

I. (*a*) *Mixed Teak Forest.*—This sub-type occupies the largest portion of the forest area. It consists of an open crop of miscellaneous species, with a varying proportion of Teak, from practically nil to as much as 50 per cent or more. With an average height of seldom more than 30 feet and sometimes even much less, it is found on the driest soils, and is equally common on trap and sandstone. Bamboos are absent, and the undergrowth is mainly represented by a crop of grass. The commonest species in this type are, besides the Teak, *Terminalia tomentosa, Anogeissus latifolia, Diospyros melanoxylon, Lagerstrœmia parviflora, Acacia Catechu, Odina Wodier, Buchanania latifolia, Bassia latifolia, Zizyphus xylopyra, Flacourtia Ramontchi, Phyllanthus emblica* and *Boswellia serrata.* It is now commonly known as the C. P. type of deciduous forest. Where grazing is heavy and has been persistent for long periods thorny species such as *Carissa spinarum, Acacia pennata* and *Zizyphus Œnoplia* are in the ascendancy.

Where the underlying rock is sandstone, *Chloroxylon Swietenia, Soymida febrifuga, Randia dumetorum,* and *Gardenia turgida* are commonly met with. A further characteristic of this type of forest is the number of different kinds of Asclepiad climbers especially on the driest and poorest soils.

I. (*b*) *Mixed Teak Forest.*—In this sub-type we include the mixed Teak forests found on well drained slopes, and in valleys where the soil covering is a rick deep loam, resulting in a vigorous growth and normal development.

The characteristics of this type of forest are a good straight growth of Teak up to 60 feet in height, and 3-5 feet in girth. Associated with it are to be found straight tall specimens of *Terminalia tomentosa, Lagerstrœmia parviflora, Pterocarpus Marsupium, Diospyros melanoxylon, Adina cordifolia, Terminalia belerica,* and *Stereospermum suaveolens,* while forming a kind of lower storey we find *Schleichera trijuga,* species of *Grewia, Kydia calycina, Holarrhena antidysenterica, Bauhinia malabarica, Casearia tomentosa* and *graveolens,* and *Albizzia odoratissima.*

The bamboo *Dendrocalamus strictus* is common throughout this type frequently to the exclusion of all other undergrowth, and occasionally *Bambusa arundinacea* is met with.

Where bamboos are scare there is a dense undergrowth of such species as *Helicteres Isora, Thespesia Lampas,* several species of *Desmodium,* and *Flemingia, Embelia robusta, Petalidium barleriodes,* species of *Strobilanthes,* and *Barleria,* and *Colebrookia oppositifolia.*

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Numerous climbers are also found, chief of which are *Bauhinia Vahlii*, *Butea superba*, *Vitis auriculata*, *Millettia auriculata*, and *Spathiolobus Roxburghii*.

This type of forest is not uncommon in the plateau divisions of Hoshangabad, Betul, Chindwara, Melghat, Seoni, and S. Mandla.

II. *Salai Forest.*—This consists of almost pure *Boswellia serrata* growing as a very open crop associated with *Cochlospermum gossypium*, *Sterculia urens* and stunted specimens of *Acacia Catechu*. Shrubby undergrowth is practically non-existent, and the grasses are mainly species of *Aristida*. This type of forest is commonest on the dry trap hills in the western portion of the area, especially in Nimar and parts of Berar.

III. *Anjan Forest.*—*Hardwickia binata*, the Anjan, is peculiar to the western and south-western limits of the area, and being gregarious, is sometimes found as a pure forest. In association with other species Anjan frequently constitutes the major portion of the crop. It is most frequently found on sandstone where it develops to a considerable size, as for instance along the Nerbudda in Nimar, and on the Pachmarhi hills in Hoshangabad. It is however not uncommon on trap in Nimar and Buldana, on which formation it occasionally forms pure forests.

IV. *Sal Forest.*—*Shorea robusta*, the Sal, is like the Anjan gregarious, and constitutes pure forests over considerable areas. It is particularly partial to sandstone, conglomerate, and gravelly soils, which it finds in the Gondwana formations in the Pachmarhi and Mahadeo hills in Hoshangabad, and also in Chindwara, and the north-east of Jubbulpore. But the chief Sal area is found in the S. Mandla Division in the Bunjar, Motinala, and Dindori ranges. In the two former ranges the underlying rock belongs either to the Transition or Gneissic system. The rocks yield a sandy soil peculiarly favourable to the growth of Sal. In the Dindori Range the Sal extends on to the trap area which is here commonly capped with laterite. On pure trap the Sal does not do well, but on laterite, or on mixed soil derived from both formations, it grows well except where the soil is shallow. At the best however it is poorer than the Sal on the crystalline rocks of the Banjar and Motinala ranges. The Sal has several very characteristic associates which do not as a rule occur elsewhere. Chief of these are *Dillenia aurea*, *Dillenia pentagyna*, and *Sterculia villosa*, while of species that occur in other types of forest the commonest are *Garuga pinnata*, *Careya arborea*, *Stereospermum suaveolens*, *Randia uliginosa* and *dumetorum*, *Buchanania latifolia* and *Ehretia lævis*. The undergrowth similarly includes certain characteristic shrubs such as *Phœnix acaulis*, *Grewia Rothii*, *Strobilanthes auriculatus*, *Ochna pumila*, *Careya herbacea*, and *Combretum nanum*.

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SYNOPSIS OF NATURAL ORDERS.

I. DICOTYLEDONS.

The stem consists of pith, wood, bast and bark, which form concentric cylinders, wood and bast being separated in the growing stem by a continuous layer of long soft cells (cambium), which forms new wood on the inside and new bast on the outside of the cylinder. Leaves net veined. Parts of the flower usually in fours or fives. Embryo with two cotyledons which, when the seed germinates, are as a rule raised above the ground.

A. POLYPETALÆ.

Flowers in the majority of species bisexual, as a rule with both calyx and corolla, the corolla consisting of distinct petals.

1. THALAMIFLORÆ.

Sepals usually distinct, petals and stamens hypogonous, ovary free. A disk frequently present.

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Ranunculaceæ.—Herbs or climbing shrubs. L. opposite, simple or compound. Sepals 4, petaloid. Petals O. Stamens ∞, carpels ∞, each with one ovule. 1

Dilleniaceæ.—Trees. L. alternate, simple, penninerved, petioles sheathing. Stipules O. Fls. large, white or yellow. Sepals 5, persistent, imbricate. Petals 5, caducous. Stamens ∞. Carpels one or many, more or less distinct. 2

Magnoliaceæ.—Trees. L. alternate, simple, stipules convolute, deciduous. Sepals and petals alike in whorls of 3, deciduous. Stamens ∞. Carpels numerous on an elongated axis. ... 3

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Anonaceæ.—Trees. L. alternate, simple. Stipules O. L. furnished with resin cells, visible as translucent dots. Sepals 3, petals in one or two whorls of 3. Stamens usually ∞, filaments short. Fr. of one or more sessile or stalked 1- or many-seeded carpels (confluent in Anona). 3

Menispermaceæ.—Climbers. L. alternate, simple, usually palminerved. Stipules O. Fls. small, unisexual. Sepals in two whorls of 3. Stamens usually 6, equal in number and opposite to petals. Carpels 1 or 3, distinct, drupaceous. ... 5

Berberidaceæ.—Shrubs. L. alternate, simple, glabrous. Sepals and petals alike, 6 each in two rows, free. Stamens opposite to petals, anthers adnate. Carpels 1. 6

Papaveraceæ.—Herbs. Juice milky or coloured. L. alternate, lobed. Stipules O. Sepals 2-3. Petals 4-6 imbricate in two rows. Stamens ∞. Carpel 2-4 celled dehiscing by valves. ... 7

Capparidaceæ.—Herbs, shrubs or trees. L. alternate, simple. Stipules often present and spinescent. Fls. bisexual, often irregular. Sepals 4. Petals 4. Stamens numerous, filaments filiform. Carpels connate into a 1-celled ovary with 2-4 parietal placentas, often on an elongated gynophore. ... 7

Bixaceæ.—Trees or shrubs. L. alternate, simple, stipules small or O. Fls. 1- or 2-sexual, regular, 5-merous or petals O. Stamens numerous. Ovary 1-celled. Ovules on several parietal placentas. Fr. fleshy or dry, indehiscent or valvular. ... 11

Portulaceæ.—Herbs. L. opposite, simple. Stipules scarious or O. Fls. regular. Sepals usually 2. Petals 4-6, free. Stamens 8-many. Ovary 1-celled, ovules numerous. Fr. a membranous capsule. 12

Tamaricaceæ.—Shrubs. L. alternate, small, scale-like. Fls. regular, in spikes, racemes or panicles. Sepals and petals usually free, pentamerous. Stamens 5 or 10, inserted on a glandular disk. Capsule 3-5-valved. Seeds tufted. ... 13

Dipterocarpeæ.—Resinous trees. L. alternate, simple, penninerved. Stipules early caducous. Fls. bisexual, regular, in spikes or racemes. Calyx segments 5, much enlarged in fr. Petals 5, contorted. Stamens numerous. Fr. indehiscent, 1-seeded. 14

Malvaceæ.—Herbs, shrubs or trees. L. alternate, mostly stipulate, frequently lobed, generally palminerved. Fls. bisexual, regular, frequently supported by 2 or more involucral bracts. Sepals 5, more or less connate. Petals 5, base adnate to staminal column. Stamens numerous, connate into a tube. Carpels numerous, usually whorled round a central axis. ... 14

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Sterculiaceæ.—Trees or shrubs. L. alternate, simple or lobed, usually palminerved, stipulate. Sepals 5-valvate, usually connate. Petals 5 or O. Stamens 5 up to 20 commonly united into a short tube. Fr. a dehiscent capsule or a whorl of distinct carpels. 23

Tiliaceæ.—Trees, shrubs or herbs. L. alternate, simple, stipules deciduous. Fls. regular, bisexual, sepals 5 usually connate. Petals 5. Stamens numerous, free. Ovary 2-10-celled. Fr. drupaceous or capsular, dehiscent or indehiscent. ... 26

Malphigiaceæ.—Climbers. L. opposite, simple, entire. Stipules small or O. Fls. bisexual, often irregular. Calyx 5-lobed, one lobe frequently furnished with a gland. Petals 5, often fimbriate. Stamens 10. Ovary 3-celled. Fr. of one or more winged samaras. 34

Zygophyllaceæ.—Herbs or shrubs. L opposite, pinnate, stipules persistent. Fls. regular. Sepals 5, free. Petals 5. Stamens 10. Fr. of several dehiscent or indehiscent cocci, sometimes spiny. 34

Rutaceæ.—Trees or shrubs. L. aromatic, dotted with translucent glands, alternate, simple or compound. Stipules O. Fls. regular, sepals and petals 4-5. Stamens 8-10 or numerous, inserted on an annular disk. Carpels 4-5. Fr. a capsule, berry or drupe. 35

Simarubaceæ.—Trees or shrubs with bitter bark. L. alternate, usually compound. Stipules O. Fls. regular, small, often unisexual. Sepals 3-5, usually connate. Petals 3-5. Stamens equal in number to or twice as many as petals. Ovary of 1-5 connate or distinct carpels. Fr. drupaceous or of 1-5 samaras. 38

Ochnaceæ.—Shrubs. L. alternate, simple, glabrous, stipulate. Fls. regular, bisexual. Sepals 4-5, free, persisting. Petals 4-5, free, deciduous. Stamens ∞. Fr. of 3-10 drupes seated on an enlarged disk. 39

Burseraceæ.—Resinous trees or shrubs. L. alternate, imparipinnate, sometimes 1-foliolate. Fls. small, regular, calyx 3-5-lobed. Petals 3-5. Stamens as many or twice as many as the petals, inserted at base of disk. Fr. drupaceous, dehiscent or indehiscent. 40

Meliaceæ.—Trees or shrubs. Leaves alternate, generally pinnate. Stipules O. Fls. small, regular, in cymose panicles. Calyx 4-5-cleft. Petals 4-5, free. Stamens 4-10, as a rule twice the number of petals, filaments generally united into a tube. Disk between stamens and ovary, often tubular. Fr. capsular or drupaceous. 41

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Olacaceæ.—Trees or shrubs, often climbing. Leaves alternate. Stipules O. Fls. small, regular. Calyx cup-shaped, enlarged in the fruit. Petals 4-6, free or connate. Stamens as many as petals or more numerous. Fr. a 1-seeded drupe. ... 44

Celastraceæ.—Trees or shrubs, often climbing. Leaves opposite alternate, simple. Stipules minute or O. Fls. regular, small, bisexual or polygamous. Calyx small, 4-5-lobed. Petals 4-5. Stamens 4-5, inserted on a conspicuous disk. Fr. a capsule or drupe. 44

Rhamnaceæ.—Trees or shrubs, sometimes climbing. Leaves alternate, simple, often armed with stipular spines. Fls. small, regular, greenish. Calyx 4-5-cleft. Petals 4-5. Stamens opposite the petals. Disk lining or filling the calyx-tube. Ovary free or adhering to calyx-tube. Fr. dry and indehiscent, or drupaceous. 46

Vitaceæ.—Herbs or climbing shrubs. L. alternate, often compound, stipulate. Fls. regular, inflorescence cymose, generally leaf-opposed. Calyx small, entire or 4-5-dentate. Petals 4-5, valvate in bud. Stamens as many as and opposite to petals, inserted outside or between the lobes of the disk. Fr. a berry. 50

Sapindaceæ.—Trees or shrubs, rarely climbing herbs. L. alternate, simple or pinnate. Stipules O. Fls. sometimes irregular, mostly polygamous. Sepals 4-5. Petals 4-5 or O. Stamens 5-10, inserted between disk and ovary. Ovary 3-celled, often 3-lobed. Fr. capsular or indehiscent. ... 54

Anacardiaceæ.—Trees or shrubs. L. alternate, simple, trifoliolate or imparipinnate. Stipules O. Fls. regular, calyx 5-cleft, petals 3-5. Stamens 5-10, inserted under the disk. Fr. a 5-celled drupe. 56

Moringaceæ.—Soft wooded trees. L. alternate, 2-3-pinnate, pinnæ and leaflets opposite, glands at base of petioles and pinnæ. Fls. large, bisexual, irregular. Sepals 5, petals 5. Stamens 5 perfect, alternating with 5 sterile stamens. Fr. a long 1-celled 3-valved pod. 59

2. CALYCIFLORÆ.

Calyx gamosepalous, often adnate to ovary. Petals inserted on calyx, or on disk lining calyx-tube.

Leguminosæ.—Trees, shrubs or herbs. L. alternate, usually compound, stipulate. Fls. bisexual, usually irregular. Calyx more or less 5-lobed. Petals 5. Stamens 10, Flaments free or combined. Carpel one, free, Fr. a 1-celled pod. ... 60

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Combretaceæ.—Trees or climbing shrubs. L. mostly opposite, simple, stipules O. Fls. usually bisexual, regular, calyx-tube adnate to ovary and produced beyond it, segments 4-5, petals often wanting. Stamens 8-10. Ovary inferior, 1-celled. Fr. generally angled or winged. 09

Myrtaceæ.—Trees or shrubs. L. simple, either opposite wit translucent glands, or alternate without glands. Stipul O. Fls. regular, generally bisexual. Calyx 4-5-lobed, pet 4-5. Stamens ∞ inserted with the petals in the mo of the calyx-tube. Fr. usually fleshy. 115

Melastomaceæ.—Shrubs. L. simple, opposite, usually ith 7 basal nerves, stipules O. Fls. regular, bisexual, calyx 4-5-lobed, the tube free or partially adnate to ovary. Petals as many as calyx-lobes. Stamens twice the number of calyx segments. Ovary 4-celled.... 118

Lythraceæ.—Trees or shrubs. L. opposite, simple, entire. Stipules O. Calyx cup-shaped, persistent. Petals same number as calyx teeth, imbricate and crumpled in bud. Ovary as a rule superior. 118

Onagraceæ.—Herbs or undershrubs. L. alternate, simple. Stipules O. Fls. bisexual, regular. Calyx-tube adnate to ovary, limb 2-5-lobed. Petals alternate with calyx-lobes. Stamens twice as many as calyx-lobes. Ovary inferior. ... 120

Samydaceæ.—Trees or shrubs. L. alternate, simple, with translucent glands. Stipules small. Fls. small, regular, generally bisexual. Calyx persistent, 4-5-lobed. Petals O. Stamens double the number of calyx-lobes. Capsule 2-4-valved. 120

Cucurbitaceæ.—Climbing herbs. L. alternate, simple or palmately divided. Tendrils simple or divided, spirally twisted. Fls. unisexual, yellow or white. Calyx-tube adnate to ovary, usually 5-lobed. Petals as many as calyx-lobes. Stamens generally 3. Ovary inferior. Fr. usually a fleshy berry. 122

Cactaceæ.—Stems and branches succulent and prickly. Fls. regular, bisexual, solitary. Calyx-tube adnate to ovary, petals numerous, imbricate. Stamens ∞. Fr. fleshy. ... 128

Araliaceæ.—Trees or shrubs, erect or climbing. L. alternate, simple or compound. Fls. regular, usually pentamerous, umbellate. Calyx adnate to ovary, petals caducous. Stamens as many as petals, inserted outside disk. Fr. a drupe or berry. 128

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Cornaceæ.—Trees or shrubs. L. alternate, entire, stipules O. Fls. regular, calyx-tube adnate to ovary, limb persistent. Petals 8-10. Stamens as many as or more numerous than petals. Fr. drupaceous. 128

B. GAMOPETALÆ.

Fls. usually bisexual, as a rule with both calyx and corolla. Corolla gamopetalous.

Rubiaceæ.—Trees or shrubs. L. opposite, simple, stipules as a rule interpetiolar. Fls. regular and bisexual, calyx-tube adnate to ovary. Corolla-lobes usually 4-5. Stamens as many as segments of the corolla, inserted in the corolla-tube. Ovary inferior, usually 2-celled. 127

Compositæ.—Shrubs or herbs. L. alternate, stipules O. Inflorescence a dense head of many small flowers, sessile on a broad receptacle and enclosed in an involucre of whorled or imbricate bracts. Calyx usually a pappus of hairs on the top of the ovary. Stamens on the corolla-tube, usually connate. Fr. indehiscent. 139

Plumbaginaceæ.—Herbs or shrubs. L. alternate entire. Fls. regular, bisexual, pentamerous. Ovary free, 1-celled. Fr. capsular, dehiscent. 138

Myrsinaceæ.—Small trees or shrubs. L. alternate, simple, generally gland-dotted, stipules O. Fls. bisexual or polygamous, usually 5-merous. Calyx persistent, free. Corolla-tube short or none. Ovary superior, 1-celled. 138

Sapotaceæ.—Trees, with milky juice. L. alternate, stipules caducous or O. Fls. bisexual, calyx persistent, segments 4-8, almost distinct, corolla-tube short, lobes 6-24. Fr. a 1-8-seeded berry, seeds oily. 139

Ebenaceæ.—Trees or shrubs. L. alternate, rarely sub-opposite, stipules O. Fls. regular, usually diœcious, calyx gamosepalous, persistent and generally enlarged in fr., segments 4-6. Corolla segments 4-6, stamens 16, often in pairs. Fr. globose, the seeds embedded in soft pulp. 141

Oleaceæ.—Trees or shrubs frequently climbing. L. opposite, simple or imparipinnate, stipules O. Fls. regular, bisexual. Calyx small, truncate, 4-9-lobed. Corolla-lobes 4-12. Stamens 2, ovary free, 2-celled. Fr. capsular or a berry. 143

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Salvadoraceæ.—Glabrous trees or shrubs. L. opposite, simple, stipules minute. Fls. small, 4-merous, calyx small, corolla membranous. Ovary free, 1-celled. 146

Apocynaceæ.—Trees or shrubs often twining, juice usually milky. L. opposite or whorled, simple, stipules O. Fls. regular, bisexual, usually 5-merous. Calyx free, corolla-lobes spreading, stamens 5, inserted in the corolla-tube. Carpels two, usually distinct, seeds often with a tuft of hairs. ... 146

Asclepiadaceæ.—Perennial herbs or shrubs, usually climbing. L. opposite, simple, stipules O. Fls regular, bisexual, 5-merous, calyx inferior, usually divided to the base. Stamens 5, inserted on the base of the corolla, anthers and filaments cohering or connate, enclosing the stigma, pollen as a rule united into waxy masses. Carpels two, distinct. Seeds usually winged and surmounted by a dense brush of hair. 151

Loganiaceæ.—Trees or shrubs. L. opposite, simple, stipules reduced to a raised line or O. Fls. regular, 4 or 5-merous. Ovary free, 2-celled. Fr. capsular or indehiscent. ... 158

Boraginaceæ.—Trees or shrubs. L. alternate, simple, stipules O. Fls. bisexual, as a rule regular, and 5-merous, in dichotamous cymose panicles. Calyx free, persistent. Ovary superior, 2-4-celled. Fr. a drupe. 159

Convolvulaceæ.—Herbs rarely shrubs, usually twining. L. alternate, simple or lobed, stipules O. Fls. bisexual, regular, 5-merous, sepals distinct, persistent. Corolla campanulate or funnel-shaped. Fr. a berry or capsule, seeds 2-4. ... 169

Solanaceæ.—Herbs or shrubs. L. as a rule alternate, stipules O. Fls. regular, bisexual, 5-merous. Calyx usually gamosepalous, ovary free, 2-celled. Fr. a berry or capsule. ... 169

Bignoniaceæ.—Trees or shrubs. L. opposite, compound, leaflets opposite, stipules O. Fls. bisexual, usually irregular, calyx free, gamosepalous, truncate, split or toothed. Corolla tubular or campanulate. Stamens 4, rarely 5. Ovary free, supported by an annular disk. Fr. an elongate dehiscent capsule. 170

Acanthaceæ.—Herbs or shrubs. L. opposite, simple, stipules O. Fls. bisexual, mostly irregular. Calyx 5, rarely 4-partite, corolla 2-lipped or 5-lobed. Stamens 4 or 2, inserted on the corolla-tube. Ovary free, 2-celled. Fr. capsular, the seeds seated on hard curved acute supports. 174

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Verbenaceæ.—Trees or shrubs. L. opposite, or whorled, gland-dotted, stipules O. Fls. bisexual, usually irregular. Calyx usually gamosepalous, persistent, often enlarged in fr. Corolla 4-5-lobed. Stamens 4, nearly equal, or one pair longer. Ovary 2 or 4-celled. 181

Labiatæ.—Herbs, rarely shrubs. Branches usually 4-sided. L. opposite or whorled, generally glanular beneath, stipules O. Fls. bisexual, irregular, calyx 4-5-fid. or 2-lipped, persistent. Corolla usually 2-lipped. Stamens 4 in pairs. Ovary free, usually 4-lobed, supported by the annular disk. Fr. of 4 one-seeded nutlets. 189

C. MONOCHLAMYDEÆ.

Fl. frequently unisexual. Perianth as a rule simple, rarely a distinct calyx or corolla.

Amarantaceæ.—Mostly herbs. L. opposite, stipules O. Fls. usually bisexual, perianth of 5 persistent sepals. Stamens opposite the sepals, ovary free, 1-celled. 191

Chenopodiaceæ.—Mostly herbs. L. alternate, simple, stipules O. Fls small, perianth of 3-5 sepals, stamens opposite the sepals. Fr. enclosed in the perianth. 191

Polygonaceæ.—Herbs, rarely shrubs. L. alternate, simple, stipules scarious, usually sheathing. Fls. small, usually bisexual, perianth of 4-6 persistent segments, stamens 5-8 opposite the segments. Ovary free, 1-celled, compressed or trigonous. Fr. a small hard nut. 192

Aristolochiaceæ.—Herbs or shrubs often climbing. L. alternate, stipules O. Fls. bisexual, perianth tubular, 3-lobed or 2-lipped. Ovary inferior, 4-6-celled. 192

Lauraceæ.—Aromatic trees or shrubs. L. alternate, evergreen, gland-dotted, stipules O. Perianth regular, deeply 6-cleft, stamens normally 12 in 4 circles, those of the innermost circle often suppressed. Ovary free, 1-celled. Fr. a berry or drupe. 193

Loranthaceæ.—Evergreen parasitic shrubs, on stems and branches of other trees. L. usually opposite, entire, sometimes wanting. Fls. regular, perianth simple or double, stamens equal to and opposite the perianth lobes. Ovary inferior, 1-celled. Fr. a berry or drupe, usually viscid. 194

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Santalaceæ.—Trees or shrubs, mostly root parasites. L. alternate or opposite, entire, stipules O. Perianth usually adnate to ovary, 3-4-lobed, stamens opposite to lobes. Ovary 1-celled. Fr. a drupe. 195

Euphorbiaceæ.—Trees, shrubs, and herbs, often with milky juice. L. usually alternate, simple, stipulate Perianth usually simple and calycine, petals in some genera. Ovary superior, usually of 3 carpels more or less united, styles ... Fr. a capsule of three 2-valved cocci, or a drupe with 3 cells. 196

Urticaceæ.—Trees, shrubs, or herbs, juice frequently milky. L. usually alternate, simple, stipulate. Fls. usually minute, unisexual, often crowded on receptacles, which are globose, cylindric, or hollow. Perianth simple, calycine, lobed or partite. Stamens as many as and opposite the perianth lobes. Ovary superior, 1-celled. 207

Salicaceæ.—Trees or shrubs. L. alternate, simple, stipulate Fls. diœcious, in catkins, similar in both sexes, 1 fl. in the axil of each bract, a disk at the base of stamens and ovary, perianth O. Ovary 1-celled. Seeds minute, enclosed by long silky hairs. 217

II. MONOCOTYLEDONS.

Fibro-vascular bundles scattered in the cellular tissue of the stem. Pith, wood, and bark not distinct, no continuous cambium layer and no regular increase in thickness by the formation of concentric layers of new wood and bark. L. in sheaths, the blade usually with longitudinal nerves, and undivided transverse veins. Perianth when present, stamens and usually carpels, in threes or multiples of three. Cotyledon one, remaining enclosed in the germinating seed.

Orchidaceæ.—Herbs, either terrestial or epiphytes. Fls. bisexual, irregular. Perianth of 6 free or connate segments, 2-seriate. Stamens and style united in a column opposite the lip, anther usually 1, on the column, 2 or 4-celled. Ovary inferior, 1-celled. Fr. a capsule. 217

Scitaminaceæ.—Herbs, frequently with a pseudo-stem of convolute leaf sheaths. Leaves radical or cauline. Fls 1- or 2-sexual, irregular. Perianth 2-seriate, outer segments free or connate into a spathaceous tube, inner segments connate. Stamens only 1 or 5 perfect. Ovary 3-celled, inferior. ... 218

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Amaryllidaceæ.—Perennial herbs with bulbous or tuberous root-stock. L. radical. Perianth regular or irregular, 2-seriate, 6-partite. Stamens 6, adnate to the bases of the perianth segments. Ovary 3-celled, inferior. 218

Dioscoreaceæ.—Large climbing herbs, with thick fleshy tuberous root-stock. L. alternate or opposite, simple or compound. Fls. small, usually 1-sexual, male and female in separate spikes. Perianth campanulate or rotate, 6-fid. Stamens 6, all perfect or 3 reduced to staminodes. Ovary inferior, triquetrous. Fr. a 3-valved capsule. 219

Liliaceæ.—Perennial herbs with creeping root-stock or bulbous roots. Perianth usually 6-merous in two series. Stamens usually 6. Ovary 3-celled. 222

Palmæ.—Stem solid, usually unbranched, with a terminal crown of pinnately or palmately divided leaves. Inflorescence with large sheathing bracts. Fls. unisexual or polygamous, [illegible] and [illegible] of 3 segments each. Carpels 3, [illegible] 3-celled [illegible] berry. 223

Gramineæ.—Erect or decumbent, or creeping herbs, or in [illegible] shrubs or trees, stems hollow jointed. L. linear or oblong with a sheathing base. Inflorescence usually terminal, composed of spikelets consisting of one or more fls. in the axils of chaffy bracts (glumes). Fls. 1-sexual, stamens usually 3, ovary entire, 1-celled. 225

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HINTS FOR USING THE ARTIFICIAL KEYS.

1. *A pocket lens with as large a field as possible is absolutely essential when using the Keys.*

2. It should be remembered that in using a character such as *dimension* of leaves, variation and abnormalities are bound to occur, and consequently [illegible] s larger or smaller than dimensions given may be co[illegible] ross. *A decision should be based on the average size of the [illegible] of a whole plant, not on a single specimen leaf.*

3. The character *stipulate* or *exstipu[illegible]* [illegible]s been used [illegible] considerably, especially in the Key for Tre[illegible] must be a[illegible] [illegible] it is not always an easy charact[illegible] [illegible]etermine. [illegible] [illegible]ipules of many species fall very early [illegible]quently b[illegible] [illegible] leaf has fully developed. In such cases the existe[illegible] [illegible]re [illegible]pules can only be determined by a careful examination of [illegible] buds and the undeveloped leaves. Where the stipules have already fallen, small scars are usually visible on either side of the base of the petiole. *A species should not be classed as exstipulate until the buds and youngest leaves of all have been carefully examined with the pocket lens.*

4. Glands on leaves are either translucent and then visible by *transmitted light*, or opaque, in which case they will be visible by *reflected light*. *In many cases, but more especially those of glands and scales visible by reflected light, the use of the pocket lens is absolutely necessary to detect their presence.*

5. Leaves are said to be *penninerved* or *palminerved* according as to whether there is a single midrib with side veins branching from it, or, whether there are three or more strong nerves (including the midrib) starting from the top of the petiole, termed basal nerves. It not infrequently happens however that a leaf is both penninerved and palminerved at the same time, *i.e.*, it has several basal nerves, while the midrib has [illegible] number of secondary nerves branching from it. The commonest instance of this kind of leaf is the various species of Ficus.

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For the purp[illegible] these Ke[illegible], all species whose leaves are a combination of penni[illegible]rved and [illegible]dminerved venation have been classed as [illegible]alminerved.

6. In [illegible]e and the [illegible] two opposite characters are sometimes found. [illegible]or [illegible]nce, the margin of a leaf may be entire or not entire, [illegible] branches may be armed or unarmed. *In such cases the [illegible] will be found in the Key under both categories.*

7. Non-indigenous and cultivated species printed in small type in the list are [illegible]ly omitted from the Keys. So too are all annual herbs mentioned in the list, (*e.g.*, Nos. 47—53) with the exception of climbing and twining herbs. The distinction between herbs and herbaceous undershrubs is not a very definite one, but generally *species with perennial root-stock or semi-woody at the base are [illegible]ed in the Keys.*

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ABBREVIATIONS USED IN THE KEYS.

Acum.	=	acuminate.
Ang.	=	angular.
Bas. n.	=	basal nerves.
Cadu.	=	caducous.
Cl.	=	climber.
Decid.	=	deciduous.
Dent.	=	dentate.
Ell.	=	elliptic.
Gl.	=	glabrous.
L.	=	leaves.
Lanc.	=	lanceolate.
Lat.	=	lateral.
Lflts.	=	leaflets.
Lge.	=	large.
M. S.	=	middle sized.
Orb.	=	orbicular.
Pet.	=	petiole.
Pub.	=	pubescent.
Quad.	=	quadrangular.
Sec. n.	=	secondary nerves.
Serr.	=	serrate.
Sh.	=	shrub.
Sm.	=	small.
Stip.	=	stipules.
Term.	=	terminal.
Tom.	=	tomentose.
Tw.	=	twiner.
Undersh.	=	undershrub

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GROUP KEY.

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GROUP KEY.

Trees with woody stems and branches attaining 15 ft. or more in height.

KEY.	Serial No. of species.	Ref. p. for sub. key.
I. Leaves simple.		
A. Leaves opposite or sub-opposite.		
(1) Leaves stipulate. (Stip. persistent, decid. or caducous.		
(a) Leaves not lobed.		
(i) Margins of leaves quite entire.		
α Branches unarmed.		
* Petioles over ½″ in length.	313, 314, 315, 316, 317, 495, 518.	23
** Petioles 0 or not exceeding ½″ in length.	318, 320, 325, 328.	23
β Branches spinescent. Stip. intrapetiolar. L. obovate		
Sm. tree. Bark pale grey. L. 1″—4″ long, sec. n. inconspicuous.	321	
Sm. tree. Bark reddish brown. L. 3″—8″ long.	322	
Sm. tree. Bark grey. L. 1″—3″ long, sec. n. 6—10 pr. conspicuous.	323	
(ii) Margins of leaves not entire. Stip. caducous.		
Sm. tree. L. ell., 3″—5″ long, crenate, glabrous.	111	
Sm. tree. Juice milky. L. 4″—12″ long, dentate, hispid.	518	

(2) Leaves exstipulate.		
(a) Leaves not lobed.		
(i) Margins of leaves quite entire.		
α Leaves penninerved (or palminerved in 444, 445, 447)		
* Abounding with white or yellow milky juice.		
§ Milk white. Small trees.		
L. ovate-oblong, 6"—12" long, gl. or minutely pub., sec. n. conspicuous.	351	
L. ell., 3"—8" long, usually densely tom., sec. n. conspicuous as depressions above.	352	
§§ Milk yellowish. Small tree.		
L. ell., 3"—5" long, tom.	353	
** Juice not milky.	267, 268, 269, 270, 271, 272, 279, 280, 286, 340, 348, 381, 443, 444, 445, 447, 476.	24
β Leaves palminerved, 3—5 basal nerves.		
Sm. tree. L. ovate to ell., 2"—3" long, sessile, shining.	377	
Lge. tree. L. broadly ovate, 4"—9" long; pet. 3"—5" long with shining glands at top of pet.	448	
(ii) Margins of leaves not entire. L. penni- or palminerved.		
Sm. tree. L. ovate, 3"—6" long, more or less serrate, aromatic. Pet. 1"—2" long.	446	
M.s. tree. L. 5½"—10" long, coarsely toothed, aromatic. Pet. 2"—5" long.	447	
Sm. tree. L. 1½"—2½" long, crenate-dentate. Pet. ¼"—⅜" long.	452	

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KEY—(*continued*).	Serial No. of species.	Ref. p. for sub. key.
B. Leaves alternate.		
(1) Leaves stipulate. (Stip. sometimes spinous; or caducous, and then only noticeable in bud, *e.g.*, 228, 334; or deciduous, *e.g.*, 481, 490.)		
(a) Leaves lobed.		
(i) Apex of leaves 2-lobed. L. palminerved. Stip. cadu.	228, 229, 230, 233, 234.	25
(ii) L strongly angled, or 3–7-lobed. L. palminerved.	57, 60, 61, 62, 64, 521.	25
(b) Leaves not lobed.		
(i) Margins of leaves quite entire.		
α. Leaves penninerved (*i.e.* those in which the veins are side branches of a single midrib).		
* Juice not milky.		
§ L. wholly gl. or only slightly pub. when young.	34, 482, 484, 491, 503.	26
§§ L. pub. or tom, at least beneath.	7, 23, 481, 485, 490, 491, 503.	26
** Juice milky.	334, 478, 479, 480.	26
β Leaves palminerved (*i.e.*, with 3 or more basal nerves).		
* Juice milky. L penninerved above the basal nerves. Stip. cadu., leaving annular scars. Frequently epiphytes.		

§ Leaves with equilateral base.		
† L. pub. beneath, base usually more than 3-nerved.		
Lge. tree, with aerial roots. L. 4"—8" long, minutely pub. beneath. Young shoots pub.	509	
Lge. tree, with thin aerial roots. Shoots and underside of L. clothed with rusty-grey tomentum, Sec. n. 5—7 pr.	510	
Lge. tree, aerial roots few. Shoots and L. beneath at first grey-tom., afterwards nearly gl. Sec. n. 10—15 pr.	511	
†† Shoots and L. glabrous (rarely somewhat pub. when young).	512, 513, 514, 515, 516, 517, 522.	27
§§ L. with very inequilateral base.		
Sm. tree. L. sub-rhomboid, 3"—6" long, scabrid	508	
Sm. evergreen tree L. oblong, 6"—15" long, lower half of base much enlarged.	519	
** Juice not milky. L. not penninerved above the basal nerves, except in 496.	55, 113, 231, 496	27
(ii) Margins of leaves not entire.		
α. Leaves penninerved. (Stip. cadu. except in 507).	292, 293, 489, 494, 507, 529.	28
β Leaves palminerved.		
* Leaves with only 3 basal nerves.	113, 116, 504, 505, 506	28
** Leaves with more than 3 basal nerves. Stip. decid.	65, 69, 70, 71, 72, 73, 518, 521.	28

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KEY—(*continued*).	Serial No. of species.	Ref. p. for sub. key.
(2) Leaves exstipulate.		
(a) Leaves lobed.		
Sm. tree. with fluted bark. L. 5-lobed, 4"—9" across, grey-tom. beneath.	27	
(b) Leaves not lobed.		
(i) Margins of leaves quite entire.		
α. Leaves penninerved. [3 basal nerves in 312.]		
* Leaves glabrous on upper surface.		
§ Petioles not exceeding ½" in length.		
† Leaves small or m. s. not exceeding 4" in length	9, 270, 271, 336, 338	29
†† Leaves large 4"—12" long (rarely some 3")	11, 137, 312, 340	29
§§ Petioles exceeding ½" in length.	28, 136, 138, 140, 266, 267, 335, 382, 471.	30
** Leaves pubescent on both surfaces.	10, 23, 272, 273, 337, 339.	30
β Leaves palminerved; basal nerves 3—5.		
Sm. tree. L. orb. or obovate, 2"—5" long, glabrescent beneath.	379	
Sm. tree. L. broadly ovate, 4"—8" long, densely grey-tom. beneath.	380	
Sm. tree. Branchlets spinescent. L. ell. or oblong-lanc. 3"—6" long. Bas. n. 3.	312	
γ Leaves minute and scale like.		
Sm. tree. L. semi-amplexicaul, loosely appressed.	31	
Sm. tree. L. sheathing, and closely appressed	32	
(ii) Margins of leaves not entire.	4, 5, 6, 8, 29, 90, 281, 282, 383.	31

II. Leaves compound.		
A. Leaves opposite.		
(1) Leaves imparipinnate (*i.e.*, simply pinnate with an odd term. leaflet.)	347, 413, 414, 416, 417, 451.	31
(2) Leaves 2—3-pinnate.		
Sm. soft wooded tree. L. 3—5 ft long; lflts. ovate 3″—5″ long, pet. ¼″—½″.	415	
M.s. tree. L 1—3 ft long; lflts. ovate 2″—3″ long, almost sessile.	418	
Tall avenue tree. L. 1—2 ft. long; lflts. ovate 1″—2″ long, sinuate or crenate.	419	
B. Leaves alternate.		
(1) Leaves paripinnate (*i.e.*, with an even number of lflts.)		
(a) Leaves with 1 pr. of leaflets.		
Sm. tree with sharp thorns. Lflts. ell. or obovate ¾″—1½″ long.	96	
Lge tree. with drooping foliage. Lflts. obliquely ovate, 1″—3″ long, 3—6-nerved from base.	226	
(b) Leaves with 2 or more pr. of leaflets.		
(i) Lflts. not exceeding 6 pr. (except 216 with 4—8 pr.)	105, 130, 132, 216, 225.	32
(ii) Lflts. 6 pr. or more up to 30 pr.	97, 98, 106, 107, 153, 155, 222, 227.	32

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KEY—(*concluded*).	Serial No. of species.	Ref. p. for sub. key.
(2) Leaves imparipinnate.		
(a) Leaves 3-foliolate (*i.e.*, with 3 leaflets).	20, 92, 135, 163, 174, 175, 178, 202.	33
(b) Leaves with at least 5 leaflets.		
(i) Lflts. (below the term.) in prs. opp. or sub.-opp.	89, 91, 100, 101, 104, 139, 141, 208.	33
(ii) Lflts. all alternate.	87, 88, 202, 203, 204, 205, 207.	34
(3) Leaves 2-pinnate.		
(a) Branchlets armed with prickles or stipular spines.	240, 241, 246, 247, 249 250, 251, 252, 256.	34
(b) Branchlets unarmed.	257, 258, 259, 260	35
(4) Leaves 2—3-pinnate.		
M.s. tree Pinnæ opp. or alt. 3—4 pr. Lflts 3—11, ovate, ½″—2″ long, serrate.	103	
Sm. tree. Bark corky. Pinnæ opp. Lflts. ovate or obovate, ½″—¾″ long, entire.	142	
(5) Leaves digitate.		
Tall straight tree. Trunk and branches often with hard conical prickles. Lflts. 5—7, lanc. 3″—7″ long.	58	

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CSL

SUBSIDIARY KEYS TO GROUP KEY FOR TREES.

I. A. (1) (a) (i) ^{a} *.

Petioles over ½″ in length.

Serial No.

Leaves penninerved.

L. pubescent on both surfaces.

Lge. tree. L. ell. 4″—10″ long, base narrowed into pet. 1″—3″ long. Stip. glandular serr. decid. — 316

Sm. tom. tree. L. ovate-lanc. densely grey-tom. beneath. Pet. ½″—1″ long. Stip. recurved. — 317

L. glabrous above. Stip. caducous.

Lge. tree. L. ell.-oblong, pub. beneath. Stip. lanc. Pet. ¾″—1¼″ long. — 313

Lge. tree; bark rough, grey. L. orb. pub. beneath. Stip. oblong. Pet. 2″—4″ long. — 314

M. s. to lge. tree; bark smooth, grey. L. broadly ell. gl. beneath. Stip. obovate. Pet. ⅜″—¾″ long. — 315

Leaves palminerved. Basal nerves 3—5.

Juice milky. Stip. cadu. leaving annular scars.

Sm. tree. L. ovate-oblong, scaurid above, clothed beneath with short stiff hairs. — 518

Juice not milky. Stip. minute, caducous.

Lge. tree. L. ovate-cordate, clothed beneath with cottony wool ... — 495

I. A. (1) (a) (i) ^{a} **.

Petioles O or not exceeding ½″ in length.

Leaves glabrous and shining.

Bark smooth, light grey. Stip. intrapetiolar.

Sm. tree. L. ell.-oblong, 6″—10″ long; sec. n. prominent 20—25 pr. — 318

Sm. tree. L. broadly ell. 4″—8″ long; sec. n. prominent 10—20 pr. — 320

Bark thick, dark brown. Stip. interpetiolar.

Sm. evergreen tree. L. coriaceous, ell. 3″—6″ long. Stip. cuspidate — 326

Leaves not shining, usually pub. or tom.

Bark corky, deeply cracked, greyish-yellow.

M. s. tree; branchlets 4-angled. L. ell.-obovate 4″—8″ long. Stip. connate, sheathing. — 328

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I. A. (2) (a) (i) ^{a} **.

Juice not milky.

Serial No.

Leaves with 1—2 glands at top of pet.

Sm. or m. s. tree ; bark brown with shallow cracks. L. ell.-oblong, silky. 267

Lge. tree ; bark smooth, light grey. L. coriaceous, oblong, gl. ... 268

Lge. tree ; bark black ; deeply cracked. L. coriaceous ell.-oblong pub. beneath. 269

Leaves without glands on petiole.

L. glabrous and shining.

L. gland-dotted, visible as translucent dots.

Lge. tree. L. ell.-lanc. with numerous fine parallel sec. n. Pet. ½″—1″ long. 279

Sm. tree. L. lanc. with numerous fine parallel sec. n. Pet. ¼″—½″ long. 280

L. not gland-dotted.

M. s. tree ; bark ash coloured. L. ell.-oblong, 2″—4″ long, sessile, pale beneath. 286

Sm. tree ; bark almost black. L. ell.-lanc. 1½″—2″ long. Pet. ⅜″—½″ long. 476

L. fleshy, glaucous.

Sm. evergreen tree. L. glaucous green, lanc. to ovate 2″—3″ long 348

L. rough above, stellate pub. beneath.

M. s. tree. L. oblanc.-oblong, 3″—4″ long, apex rounded ... 381

M. s. or lge. tree; bark buff coloured. L. very large ; ell. or obovate, 12″—24″ long, clothed beneath with grey stellate tomentum. 443

L. silky, pub. or villous, at least beneath. Not rough.

L. not exceeding 2′ in length.

M. s. tree. Bark dark, rough. L. ell. 1″—2″ long, silky hairy beneath. 271

Sm. to lge. gregarious tree. L. broadly ell. or obovate, ¾″—1½″ long, clothed soft appressed hairs. 272

L. exceeding 2′ in length.

M. s. tree. Bark white, smooth. L. broadly ell. 2″—4″ long, gl. when mature. 270

Sm. tree. Bark thin, grey. L. ovate-cuneate, 3″—6″ long, with strong fœtid smell. Pet. ½″—1″. 444

Sm. tree. Bark thick, bluish-grey. L. ovate 5″—10″ long, villous beneath. Pet. 2″—3″. 445

M. s. tree. Bark light brown. L. ovate, 5½″—10″ long, villous or pub., aromatic Pet. 2″—5″. 447

L. coriaceous and gl. above, tom. beneath.

Lge. tree ; bark black exfoliating in rectangular scales. L. ell. or ovate 3″—12″ long. 340

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I. B. (1) (a) (i).

Apex of leaves 2-lobed. L. palminerved. Stip. caducous.

Serial No.

Lobes of leaf rounded.

Sm. tree. L. 1″—2½″ long, divided ¼ of the way down. Bas. n. 7—9 — 229

Sm. tree. L. 2″—3″ long, divided less than ¼ of the way down. Bas. n. 9—11. — 230

Sm. to m. s. tree. L. 3″—6″ long, divided ¼ of the way down. Bas. n. 11—15. — 23

Lobes of leaf obtuse.

Sm. tree. L. 2″—3″ long, nearly as broad as long. Bas. n. 7—9 ... — 228

Lobes of leaf sub-acute.

Sm. tree. L. 4″—5″ long, about as broad as long. Bas. n. 9—11 ... — 238

I. B. (1) (a) (ii).

Leaves strongly angled or 3—7-lobed. L. palminerved. Stip. caducous.

Juice milky.

Sm. tree. L. broadly ovate, 3″—5″ long, deeply 3—5-lobed; lobes dentate. — 521

Juice not milky.

Margins of lobes entire.

Sm. tree. L. roundish 3″—6″ diam. slightly 3—7-lobed. Pet. 1″—2″ long. — 57

Lge. tree; bark smooth, white or pink. L. 8″—12″ diam. 5-lobed, tom. beneath. Pet. 5″—9″ long. — 60

Lge. tree; bark ash-coloured. L. 6″—12″ diam. 3—5-lobed, almost gl. Pet. 3″—8″ long. — 62

Margins of lobes not entire.

M.s. tree. L. 10″—18″ diam. deeply 5—7-lobed, each lobe mostly with 3 teeth. — 61

Lge. tree. L. orb. 6″—12″ diam. sinuately lobed, densely white tom. beneath. — 64

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I. B. (1) (b) (i) a * §.

L. wholly gl. or only slightly pub. when young.

Serial No.

Stipules caducous.

Lge. gregarious tree; bark dark brown with deep longitudinal fissures. L. broad-ovate 4″—10″ long, shining. Pet. ¾″—1″ long. 34

Sm. tree; bark black much cracked. L. broad ovate to orb. 2″—4″ long. Pet. ¼″ long. 482

Lge. tree; bark smooth, grey. L. ell. 3″—5″ long, often pub. beneath. Pet. ¼″—½″ long. 503

Sm. tree. L. ell.-lanc. 1½″—4″ long, acute, turning red before falling. 491

Stipules scarious, persistent.

M.s. tree. L. linear 1½″ long, arranged like the lflts. of a pinnate leaf 484

I. B. (1) (b) (i) a * §§.

L. pub. or tom., at least beneath.

L. pub. or tom. on both surfaces.

Sm. tree; bark corky. Stip. represented by recurved thorns. L. ell.-obovate, velvety pub. 23

Sm. tree; bark rough, brown. Stip. cuspidate. L. ovate or ell. 2″—6″ long. 485

L. gl. above, pub. or tom. beneath.

Leaves large, exceeding 4″ in length.

Lge. evergreen tree Leaf-buds enclosed in convolute decid. stip. L. lanc. 7″—10″ long. 7

Sm. to m. s. tree. Stip. decid. L. ell.-oblong, 4″—10″ long; sec. n. 15—20 pr. 481

Leaves sm. or m. s. rarely exceeding 4″ in length. Stip. decid.

Sm. to m. s. tree. L. broadly ell. 2″—4″ long, obtuse or emarginate 490

Sm. tree. L. ell.-lanc. 1½″—4″ long, acute 491

Lge. tree; bark smooth, grey. L. ell. 3″—5″ long, acuminate ... 503

I. B. (1) (b) (i) a * *.

Juice milky.

Branches thick and fleshy with prs. of stipular prickles.

Branches round with prs. of sharp spines on low tubercles ... 479

Branches with 5 spirally twisted ribs bearing sharp spines ... 480

Branches round, fleshy, unarmed. L. very small ... 478

Branches woody, unarmed. Stip. tawny tom. caducous.

Lge. tree. Trunk short, spreading. L. clustered, ell. 5″—8″ long 334

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I. B. (1) (b) (i) β * § † †.

Shoots and leaves glabrous (rarely somewhat pub. when young).

Serial No.

Basal nerves 3.

Lge. tree. L. oblong-lanc., 5″—7″ long, acuminate 512

M. s. or sm. tree. L. ell.-obovate, 1½″—3″ long, sec. n. very slender 513

Lge. tree. L. ovate, 2″—6″ long, coriaceous, upper surface covered with minute raised dots, sec. n. 8—12 pr. 516

Lge. tree. L. ovate, 3″—6″ long, thinly coriaceous, surface not tuberculate, sec. n. 5—8 pr. 517

M. s. or lge. tree. L. ovate, 3″—7″ long, often pub. when young; sec. n. 4—6 pr. 522

Basal nerves 5—7.

Lge. tree. L. broad-ovate, the apex produced into a long caudate tip, ⅓ length of the whole leaf. 514

Lge. tree. L. broad-ovate, base cordate, with short acuminate tip ... 515

I. B. (1) (b) (i) β * *.

Juice not milky. L. not penninerved above the bas. n. except in 496.

Sm. tree. L. broadly ovate, cordate, 3″—6″ long, acum. Bas. n. 6—7. Pet. 2″—4″. 55

Sm. tree with stip. thorns L. ovate, ¾″—2½″ long, densely tawny or white tom. beneath. Bas. n. 3. 113

Sm. tree. L. broader than long, 4″—7″ across, coriaceous. Stip. cadu. Bas. n. 7—11. 231

Sm. tree. Young parts rusty pub. L. ovate-lanc. 3″—6″ long with small red glands beneath. Bas. n. 3. Midrib penninerved. 496

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I. B. (1) (b) (ii) $^{\alpha}$.

Leaves penninerved (stip. cadu. except in 507).

Serial No.

Juice milky. Stipules obliquely lanc.

Sm. tree L. ell. or obovate, 2″—4″ long, irregularly dentate, rough on both surfaces. 507

Juice not milky. Stip. caducous.

Leaves with translucent dots.

Sm. tree. L. ell. 4″—8″ long, more or less serrate, gl. ... 292

Sm. tree. L. ell. 4″—8″ long, serrate, tom. 293

Leaves without translucent dots.

M. s. evergreen tree. L. ell.-oblong, 2″—4″ long, serrulate, base unequal-sided. 489

Sm. tree. L. lanc. 1½″—3″ long, serrulate, gl. above, white or glaucous beneath. 529

M. s tree. Shoots clothed with minute silvery scales. L. oblong-lanc. 5″—10″ long, crenate, gl. 494

I. B. (1) (b) (ii) $^{\beta}$ *.

Leaves with only 3 basal nerves.

Branches with stipular thorns. L. serrulate.

Sm. tree. L. ovate, ¾″—2½″ long, densely tawny or white tom. beneath. 113

Sm. straggly tree. L. broad-ovate, 1½″—3″ long, white tom. beneath. Thorns often absent. 116

Branches unarmed. Stip. deciduous.

Base of leaves unequal-sided. L. acuminate.

Sm tree. L. ovate-lanc. 2″—4″ long, coarsely serrate, gl. or pub. beneath. 504

Sm. tree. L. ovate 3″—6″ long, serrulate, white or grey pub. beneath. 505

Base of leaves equal-sided. L. scarcely acuminate.

Sm. tree. L. oblong-lanc. 2″—3″ long, scabrous on both surfaces 506

I. B. (1) (b) (ii) $^{\beta}$ **.

Leaves with more than 3 basal nerves.

Juice milky. Stip. decid. leaving annular scars.

Sm. tree. Branchlets hollow. L. ovate-oblong, 4″—12″ long, dentate, scabrid or hispid. 518

Sm. tree. L. broad-ovate, 3″—5″ long, dentate, rough above, softly tom. beneath. 521

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Serial No.

Juice not milky. Stip. deciduous.

L. with 7—9 basal n. ; base equal.

Sm. tree. L. orb.-cordate, 4″—5″ across, coarsely dentate, white tom. beneath. 65

L. with 5 (sometimes 3) basal n. ; base usually unequal.

M. s. tree. L. broad-ovate, 3″—5″ long, crenate-dentate, gl. on both surfaces. Stip. leafy, auricled. 70

Sm. tree. L. broad-ovate, 3″—6″ long, coarsely dentate, hoary tom. beneath. Stip. lanc. acute. 71

Sm. tree. L. ovate to orb., cordate, dentate, densely pub. beneath. Stip. lanc. 72

Sm. tree. L. ovate to ell., acum. finely serrate, white tom. beneath. Stip. linear. 73

Sm. tree. L. broad ell. or orb. 1″—2½″ long, irregularly serrate, hoary pub. on both surfaces. Stip. lanc. 69

I. B. (2) (b) (i) ᵃ * § †.

Leaves small or m. s. not exceeding 4″ in length.

Juice milky.

M. s. or sm. evergreen tree. L. obovate-oblong, 2″—4″ long, obtuse, gl. shining. 33

Juice not milky.

Leaves with translucent dots.

Sm. tree. L. oblong-lanc., 2″—3″ long, aromatic, wholly gl. ... 9

Leaves without translucent dots.

M. s. tree. Bark smooth, almost white. L. broadly ell. 2″—4″ long, gl. when mature. 270

M. s. tree. Bark light brown. L. ell. 1″—2″ long, underside clothed with long silky hairs. 271

Sm. tree. Bark rough, grey; branches often thorny. L. ovate-oblong, 2″—4″ long, pub. when young, finally gl. 333

I. B. (2) (b) (i) ᵃ *§ ††.

Leaves large, 4″—12″ long (rarely some 3″).

Leaves with 3 bas. n. ; penninerved above.

Sm. tree; branchlets spinescent. L. ell. or oblong, 3″—6″ long, pub. beneath. 312

Leaves penninerved throughout.

Lge. tree. Bark brown with longitudinal fissures. L. ovate-oblong, 4″—7″ long, tom. beneath, midrib pub. above. 11

Sm. tree. Bark dark grey, cut up in square bosses by deep narrow cracks. L. oblong, 5″—8″ long, coriaceous, villous beneath. 137

Lge. tree. Bark black, exfoliating in rectangular scales. L. ell. or ovate, 3″—12″ long, coriaceous, tom. beneath. 340

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I. B. (2) (b) (i) [a] * §§.

Petioles exceeding ½″ in length.

Serial No.

Juice milky.

Lge. evergreen tree. L. ell. 3″—4″ long, shortly acum. gl. shining 335

Juice not milky.

Petiole of leaf with two glands near the top.

Sm. or m. s. tree. L. ell.-oblong, 3′—8″ long, silky tom. or gl. when mature. 267

Petiole of leaf without glands.

Leaves glabrous on both surfaces.

Leaves clustered at the ends of branchlets.

Lge. spreading evergreen tree. Bark nearly black, rough. L. oblong, 5″—10′ long; sec. n. 15—25 pr. 136

Lge. tree. Bark bluish grey, with fine cracks. L. obovate-ell. 4″—9″ long. Sec. n. 6—8 pr. prominent. 266

Leaves not clustered.

Sm. evergreen tree. L. ovate, 4″—8″ long, acute or acum. Pet. 2″—3″ 28

M. s. tree. L. ell. 3″—6″ long, obtuse or emarginate. Pet. ¾″—1¼″ 138

Sm. tree. Bark smooth, grey. L. ell. to obovate, 3″—6″ long. Pet. ⅝″—¾″. 382

Leaves glabrescent, or permanently pub. beneath.

Sm. tree. L. obovate-oblong, 8″—18″ long, rounded at apex, pub. beneath. 140

Sm. to m. s. tree; inner bark viscid. L. ovate or ell.-lanc. 5″—9″ long, acute, more or less pub. beneath. 471

I. B. (2) (b) (i) [a] * *.

Leaves pubescent on both surfaces.

L. not exceeding 1″ in length; clothed with soft appressed hairs.

Sm. to lge. gregarious tree. L. broadly ell. or obovate, ½″—1″ long 272

Sm. to lge. tree. L. orbicular, ½″—¾″ long 273

L. exceeding 1″ in length, but not exceeding 3″.

Sm. tree; bark corky. L. ell.-obovate, 2″—3″ long, velvety pub. Sec. n. 8—10 pr. 23

Sm. tree; branches spinescent. L. ell. to obovate, 1″—2″ long, pub. above, rusty tom. beneath. 337

Sm. tree; bark blackish. L. ovate-lanc. 1″—3″ long, base rounded or cordate, velvety pub. 339

L. exceeding 3″ in length.

M. s. tree. L. ovate-oblong, 3′—9″ long, densely silky tom. Sec. n. 10—12 pr. 10

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I. B. (2) (b) (ii).

Margins of leaves not entire.

Serial No.

Leaves very large, *i.e.*, exceeding 6″ in length.

Margins of leaves serrate.

M. s. evergreen tree. L. clustered, oblong-lanc. 8″—12″ long. Sec. n. 30—40 pr. — 4

M. s. tree. L. ell. 12″—36″ long, decurrent into a short sheathing pet. — 6

Margins of leaves crenate.

Sm. crooked tree. L. obovate 6″—12″ long, narrowed into pet. Sec. n. 20—30 pr. — 5

M. s. tree. L. obovate 6″—15″ long, narrowed into pet. Sec. n. 10—12 pr. — 282

Leaves m. s. or small, not exceeding 6″ (except No. 8 with L. 3″—9″).

Branches with ax. spines.

Sm. tree. Young shoots purple. L. ovate 3″—6″ long, crenate-serrate. Pet. often winged. — 90

Branches not spinous.

Margins of leaves crenate or denticulate.

Sm. tree. L. obovate or oblanc. 2″—6″ long, denticulate, narrowed into short pet. — 281

Sm. tree. L. ell., 1½″—3″ long, coarsely crenate ... ... — 29

Margins of leaves undulate.

Tall tree. L. narrowly lanc. 3″ - 9″ long, tapering to a fine point — 8

Margins of leaves serrate.

M. s. tree. L. ell.-oblong. 4″—6″ long, acuminate ... ... — 383

II. A. (1).

Leaves imparipinnate.

Leaflets 3—7.

Lge. tree; bark smooth, white. Lflts. 3—5, lanc. 5″—7″ long. gl. except midrib beneath. — 451

Sm. tree; bark smooth, grey. Lflts. 5—7, broadly ell. to orb., ½″—1½″ long, gl. or pub. — 413

Sm. to m. s. tree. Lflts. 3—7 ovate, 2″—4″ long, acum. gl. ... — 414

Leaflets 7—11.

Leaves clustered.

M. s. tree; bark yellowish. Lflts. 7—11, ell. 3″—5″ long, caudate-acum. gl. — 416

M. s. tree; bark grey. Lflts. 7—11, broadly ovate, 3″—6″ long, acum. often serrulate, rough above. — 417

Leaves not clustered.

M. s. tree; bark ash-coloured. Lflts. 7—9, ovate, 3″—5″ long, acute, nearly gl. — 347

II. B. (1) (b) (i).

Leaflets not exceeding 6 pr. (except 216 with 4—8 pr.).

Serial No.

L. with glands between each of the 2—3 lower pr. of lflts.
Sm. tree. Lflts. 4—6 pr., ell.-oblong, 1½″—3″ long, sub-acute 225

L. without glands between the lflts.
Lflts. acute or acuminate.
Lge. tree; bark rough, grey. Lflts. 2—3 pr. lanc. 3″—7″ long, gl. above, pub. beneath. 132
Sm. tree; bark smooth, grey. Lflts. 4—8 pr. ovate-blong, 2″—5″ long, acute. gl. 216

Lflts. obtuse.
M. s. tree; bark bluish grey. L. clustered. Lflts. 3—6 pr. ell. or oblong, 2″—4″ long, gl. 105
M. s. tree; bark smooth, grey. Lflts. 2—4 pr., term. pr. 4″—9″ long, lowest pr. 1″—3″ long. 130

II. B. (1) (b) (ii).

Leaflets 6 pr. or more up to 30 pr.

Leaflets entire.
Leaflets not exceeding 1½″ in length.
M. s. tree; bark thick, corky. Lflts. 10—20 pr. oblong, ¾—1¼″ long. obtuse. gl. 107
Sm. tree, seldom over 12 ft. Lflts. 10—20 pr. linear-oblong, ½″—1″ long, obtuse, gl. [illegible]
Sm. tree, 20—30 ft. Lflts. 10—30 pr. oblong, 1″—1½″ long, glaucous. 155
Lge. spreading tree. Lflts. 10—20 pr., oblong, ½″—¾″ long, obtuse, gl. 227
Leaflets exceeding 1½″ in length.
M. s. tree. Lflts. 6—14 pr. ell. 1½″—2½″ long, tipped with a sharp mucro. [illegible]
Lge. tree; bark thin. Lflts. 5—10 pr. lanc. 2″—3″ long, acum. base unequal-sided. [illegible]
Lge. tree; bark, thick, rough. Lflts. 8—10 pr. oblong-lanc. 5″—6″ long, acute or acum., base unequal-sided. 98

Leaflets coarsely toothed.
Lge. tree. Lflts. 10—13 pr. shape variable, 4″—3″ long, tom., base very unequal-sided. 97

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II. B. (2) (a).

Leaves 3-foliolate.

Serial No.

Branches armed with ax. spines.

Sm. tree with straight ax. spines. Lflts. lanc. or ell.-lanc. 1½″—3′ long, gl. Term. lflt. with long pet. 92

Branches armed with numerous small prickles.

M. s. tree ; bark smooth, yellowish. Lflts. rhomboid-ovate, 4″—6′ long, gl. when mature. 174

M. s. tree ; bark thick, yellow, corky. Lflts. rhomboid-ovate, 4″—6′ long, densely brown tom. beneath 175

Branches without prickles or ax. spines.

Margins of leaflets entire.

M. s. tree. L. clustered. Lflts. ovate or lanc. 2″—6″ long, acute or acum. gl. 20

M. s. tree. Cut bark exudes red juice. Lflts. broadly obovate, term. 4″—8″ long, lateral obliquely-ovate, smaller, silky beneath. 178

M. s. tree. Lflts. sub.-orb. 1″—2″ long, acum. gl. 202

Margins of leaflets undulate or slightly crenate.

Sm. tree. Cut bark exudes red juice. Term. lflt. broad-oval, lateral obliquely-ovate 3″—4″ long, all coriaceous. 163

Sm. tree ; branchlets and underside of L. clothed with dense brown tom. Lflts. obovate ; term. lflt. 2″—3″ long, lateral smaller, upper portion irregularly crenate. 135

II. B. (2) (b) (i).

Leaflets (below the term.) in prs., opp., or sub.-opp.

Branches armed with straight thorns; lflts. with translucent dots.

Sm. tree. L. rachis with large wings. Lflts. 5—7, ovate, 1″—2″ long, wings and lflts. crenate. 89

M. s. tree. L. rachis not or narrowly winged. Lflts. 5—9, cuneate or obovate, 1″—2″ long, crenate at tip. 91

Branches unarmed, lflts. without dots.

Margins of leaflets entire.

M. s. spreading tree. L. clustered. Lflts. 7—11, ovate-oblong, 3″—6″ long, acum. gl. sec. n. 6—8 pr. 139

M. s. tree. Lflts. 7—11, ell.-oblong, 3″—7″ long, acum. gl. sec. n. 10—20 pr. joined at the ends by a prominent n. running close to edges of the leaf. 141

M. s. tree. Lflts. 5—7, ovate, 2″—5″ long, dark green, shortly acum. gl. shining ; sec. n. 6—8 pr. 208

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Serial No.

Margins of lflts. crenate, serrate or toothed.

M. s. tree; bark greenish-grey, peeling in thin flakes. Lflts. 17—31, lanc., crenate-serrate, more or less pub. 100

Lge. tree; bark rough, brown. Lflts. 13—19 lanc., crenate, pub. 101

Lge. evergreen tree. Lflts. 11—19 obliquely falcate-lanc., acum., serrate, gl. 104

II. B. (2) (b) (ii).

Leaflets all alternate.

Apex of leaflets acuminate.

Base of leaflets oblique, lflts. with translucent dots.

Sm. evergreen tree; bark smooth, yellowish white. Lflts. 5—7 ell. or obovate, 1″—3″ long, gl. shining. 87

Sm. tree; bark dark grey. Lflts. 11—25. ovate-lanc., 1″ long, entire or crenate, pub. beneath. 88

Base of leaflets not oblique, lflts. not gland-dotted.

M. s. tree. Lflts. 3—5, sub.-orb. 1″—2″ long, gl 202

Apex of leaflets obtuse or emarginate.

Sm. or m. s. tree. Lflts. 5—7, sub.-orb., 1″—3″ long, obtuse or emarginate, gl. 203

Tall straight tree; bark smooth, light grey. Lflts. 9—13, rounded, ¾″—1″ long, turning black when dry, obtuse or emarginate. 204

Lge. tree; bark smooth, light grey. Lflts 11—17, ovate-oblong, 1″—2″ long, obtuse. 205

Lge. tree; bark rough, grey. Lflts. 7—9, ell. 2″—4″ long, obtuse, gl. shining. 207

II. B. (3) (a).

Branchlets armed with prickles or stipular spines.

Branchlets armed with ax., term. or scattered prickles.

Sm. tree. Prickles scattered. Pinnæ 2 pr. Lflts. 7—10 pr. oblong, ½″ long. 240

Sm. tree. Prickles numerous, scattered. Pinnæ 10—20 pr., small gland close to base of pet. Lflts. 20—40 pr. ½″—¾″ long. 256

Sm. tree, with ax. and term. straight thorns. Pinnæ 6—10 pr. Lflts. 12—20 pr. minute, linear. 241

Branchlets armed with paired (stipular) prickles.

Sm. tree; bark brown. Prickles curved. Pinnæ 2—4 pr. Lflts. 6—12 pr. oblong, 1″ long. 252

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Serial No.

M. s. tree; bark black. Prickles straight, white. Pinnæ 3—6 pr. Lflts. 10—20 pr. linear-oblong, $\frac{1}{8}''$—$\frac{1}{4}''$ long. 246

Lge. tree; bark grey. Prickles short, hooked. Pinnæ 4—6 pr. Lflts. 15—30 pr. linear $\frac{1}{4}''$—$\frac{1}{2}''$ long. 251

Sm. tree. Prickles long, white. Pinnæ 4—8 pr. Lflts. 8—12 pr. linear, $\frac{1}{16}''$—$\frac{1}{8}''$ long. 247

M. s. tree; bark yellowish-brown. Prickles short, straight. Pinnæ 5—15 pr. Lflts. 12—25 pr. linear, $\frac{1}{8}''$—$\frac{1}{4}''$ long. 249

Sm. tree; bark black. Prickles short, hooked. Pinnæ 10—20 pr. Lflts. 30—50 pr. minute, linear. 250

II. B. (3) (b).

Branchlets unarmed.

Pinnæ 2—5 pr.

Lge. tree; bark rough, blackish. Pinnæ 2—3 pr. Lflts. 6—8 pr. obliquely-oblong, $1\frac{1}{2}''$ long, gl. above. 257

M. s. tree; bark rough, dark grey. Pinnæ 2—5 pr. Lflts. 6—24 pr. obliquely-oblong $\frac{3}{4}''$—$1''$ long, pub. 258

Lge. tree; bark smooth, greenish-white. Pinnæ 3—5 pr. Lflts. 6—10 pr. obliquely-oblong, $1''$—$2''$ long, gl. above. 259

Pinnæ 6—15 pr.

Sm. tree; bark smooth, dark brown. Pinnæ 6—15 pr. Lflts. 12—24 pr. linear, $\frac{1}{4}''$ long. 260

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GROUP KEY.

Shrubs and Undershrubs.

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GROUP KEY.

Shrubs and Undershrubs not exceeding 15 ft. in height. Not parasitic on other trees or shrubs.

KEY.	Serial No. of species.	Ref. p. for sub. key.
I. Leaves simple.		
A. Leaves opposite.		
(1) Leaves lobed.		
Herbaceous undersh. 2′—3′. Stems quad. pub. L. pinnatisect, lobes entire or dent.	462.	
(2) Leaves not lobed.		
(*a*) Leaves stipulate.	318, 319, 324, 326, 327, 518, 523.	45
(*b*) Leaves exstipulate.		
(i) Margins of leaves quite entire.		
a. Leaves penninerved.		
* Juice milky.	349, 350, 351 364, 365.	45
** Juice not milky.		
§ L. wholly gl. or only slightly pub. when young.		
† Armed with spines.		
Branchlets ending in spines.		
Lge. sh. 8′—12′. L. lanc. or ell. 1″—1½″ long. Cultivated or semi-wild.	288.	
Spines axillary.		
Sh. 2′—4′. Spines 3-fid. L. ell. 1½″—4″ long, bristle tipped.	434.	

† Unarmed.	276, 280, 342, 423, 428, 429, 435, 436, 439, 440, 455.	46
§§ L. pub. or tom. at least beneath.	277, 287, 341, 346, 378, 408, 423, 424, 425, 426, 437, 456.	47
β. Leaves palminerved.		
Branched sh. 8′—12′. Young parts and L. clothed with appressed flat (strigose) hairs. L. ovate-oblong 3″—4″ long. Bas. n. 3—5.	285.	
M. s. sh. 4′—6′. Branches fulvous hairy. L. ovate-cordate, 4″—8″ long, with small obscure glands beneath.	454.	
(ii) Margins of leaves not entire.		
α. L. glabrous at least on the upper surface.	378, 427, 428, 446, 452, 453.	47
β. L. pub. or scabrid.	430, 431, 432, 441, 442, 454, 456, 461, 463, 464.	48
B. Leaves alternate.		
(1) Leaves lobed. L. palminerved (except 407).		
(a) Margins of lobes entire.	54, 56, 228, 407, 492, 493.	49
(b) Margins of lobes not entire.	39, 40, 76, 79, 498.	49
(2) Leaves not lobed.		
(a) Leaves penninerved.		
(i) Margins of leaves entire.		
α. Juice milky. Fleshy shrubs.		
Branches round, green, unarmed. L. very small, caducous.	478.	
Branches with 5-spirally twisted ribs bearing sharp spines.	480.	

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KEY.	Serial No. of species.	Ref. P. for sub. key.
II. Leaves compound.		
A. Leaves opposite.		
(1) Leaves imparipinnate, 3—5 foliolate.		
Lge. sh. 5′—10′. Lflts. 3—5, lanc. 2″—4″ long, white tom. beneath.	449.	
Lge. sh. 5′—10′. Lflts. 1 or 3, ell. 2′—2½″ long, white tom. beneath.	450.	
B. Leaves alternate.		
(1) Leaves paripinnate.	96, 153, 154, 217, 218, 221, 224, 225.	55
(2) Leaves imparipinnate.		
(*a*) Leaves 3-foliolate.		
(i) L. dotted beneath with minute red or yellow glands. Lflts. palminerved.		
Sm. sh. 2′—4′. Branches ang. pub. Lflts. obovate-lanc. 1″—3″ long, the term. largest, thinly silky beneath.	199.	
Erect sh. 3′—6′. Branches ang. pub. Lflts. ell 3″—5″ long, silky beneath.	200.	
Dwarf undersh. 6′—8′ with woody root-stock. Branches sub-herbaceous. Lflts obovate 5″—8″ long, lateral oblique. Pet. winged.	201.	

(ii) L. not gland-dotted beneath. Lflts. penninerved.		
a. Margins of leaflets entire.	147, 158, 161, 162, 164, 165, 166, 167, 170.	55
b. Margins of leaflets not entire.		
Lge. sh. all parts dense brown tom. Lflts. obovate, term. 2″—3″ long, lateral smaller, upper part of margin crenate.	135.	
Lge sh., branchlets spinescent. Lflts. obovate, ½″—¾″ long, upper part of margin dentate.	102.	
(*b*) Leaves with at least 5-leaflets.	129, 148, 149, 150, 151, 156, 157, 159, 160, 210.	56
(3) Leaves twice pinnate.	129, 213, 214, 215, 242, 243, 244, 245, 248.	57

Parasitic Shrubs (i.e., sending their roots into the branches of other trees or shrubs).

I. Leaves simple, opposite.

L. ell. to linear-oblong, 3″—6″ long, coriaceous, glabrous.	473.
L. and young parts clothed with white or rusty tomentum. L. ell. 2″—4″ long.	474.

II. Leaves O.

Branches flat, narrowed at the nodes, green, striate.	475.

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SUBSIDIARY KEYS TO GROUP KEY FOR SHRUBS AND UNDERSHRUBS.

I A. (2) (α).

Leaves stipulate.

Serial No.

Leaves penninerved. Margins of L. entire.

Armed with ax. decussate spines.

Lge. rigid sh. L. obovate or orb. ½″—2″ long, base cuneate, gl. ... 324

Unarmed. Stipules intra-petiolar.

Buds gummy or resinous.

Lge. sh., stems smooth grey. L. ell. oblong, 6″—10″ long, gl. Sec n. 20—25 pr. 318

Lge. sh , stems white. L. cuneate-obovate, 1½″—3″ long. Sec. n. 12—16 pr. 319

Buds not gummy.

Lge. branchy sh.; branchlets sub.-quad. L. ell. or obovate, 3′—8″ long, gl. or pub. 326

Undersh. 2′—4′. Branches almost herbaceous. Stip. persistent. L. ell.-lanc 5″—8″ long, fœtid when crushed. 327

Leaves palminerved. Margins of L. entire or dentate.

Juice milky.

Lge. sh. L. ovate-oblong, 4″—12″ long, scabrid above, entire or dentate. Bas. n. 3—5. 518

Juice not milky.

Lge. sh. L. broadly ovate, 5″—10″ long, acum. coarsely toothed. Bas n. 8. 523

I. A. (2) (b) (i) a *.

Juice milky.

Armed with straight, simple, or 3-fid. spines.

Branchy evergreen sh. L. ovate or ell. 1′—2′ long, gl. above, pub. beneath. 349

Branchy evergreen sh. L. ovate or ell. 1½″—3″ long, gl. on both surfaces. 350

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Serial No.

Unarmed.

Tall erect sh. L. ovate-oblong, 6″—12″ long, gl. or minutely pub. Sec. n. 10—14 prs. 351

Lge. sh. 6′—10′. All parts soft white woolly tom. L. obovate, 4″—8″ long, sessile. 364

Lge. sh. 4′—6′ similar to 364 but leaves 2″—6″ long, and less woolly. 365

I. A. (2) (b) (i) $_a$ ** § ††.

Unarmed.

Leaves gland-dotted, visible as translucent dots.

Lge. sh. 8′—15′. L. lanc. 3″—5″ long, with numerous fine parallel sec. n. 280

Leaves not gland-dotted.

Lge. or m. s. shrubs exceeding 4′ in height.

Sarmentose, lge. sh. 8′—12′, frequently climbing. L. ovate 3″—5″ long, acute, pub. when young. 342

M. s. branchy sh. 4′—8′ with strong fœtid smell. L. ell.-lanc. 5″—8″ long, acum. 440

Undershrubs not exceeding 4′ in height. Stems mostly herbaceous.

Stems hollow, channelled.

Undersh. 2′—4′, branches herbaceous. L. linear-lanc. 6″—9″ long. 455

Stems not hollow or channelled.

Base of leaves decurrent into petiole.

Undersh. 2′—4′. L. oblong-lanc. 5″—8″ long, acum. Pet. ½″—1½″ long. 428

Undersh. 2′—4′. L. ovate, 4″—6″ long, acum. Upper L often with rounded base. 429

Base of leaves not decurrent into petiole.

Erect undersh. 2′—3′. L. ell. 3″—6″ long, acum. base acute. 435

Erect undersh. 2′—3′. L. ell. 4″—7″ long, acum. base rounded or sub-acute. 436

Branchy undersh. 2′—4′. Stems striate, nodes swollen. L. ovate-lanc. 2″—4″ long, acute. 439

Small, shrubby, 1′—2′, many stems from the root. L. ovate, 1″—2″ long, acute, sec. n. 6—8 prs. 123

Dwarf undersh. of grass lands in Sal forest, 1′—2′, with thick woody root-stock. L. obovate, 1½″ long. 276

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I. A. (2) (b) (i) *a* ** §§.

L. pub. or tom. at least beneath.

Serial No.

Leaves with small scales or glands on the under surface.

Lge. sarmentose sh.; shoots rusty villous. L. ovate 2½″—5″ long, both surfaces tom., the lower rusty and pitted with yellow sunk scales. 277

Lge. bushy sh. L. ovate-lanc. 2″—4″ long, finely pub. with black dots on under surface. 287

Leaves without glands or scales.

Lge. shrubs at least 8′ in height.

Straggling or more or less scandent shrubs.

Branchlets grey-tom. L. ovate 1″—3″ long, acute, pub. on both surfaces Pet. ¼″—⅜″. 341

L. ovate, 2″—4″ long, acum. somewhat pub. Pet. ½″—1″ long. 456

Shrubs more or less erect, never scandent.

Branches quad. frequently drooping. L. ovate 2′—4″ long, acum. scabrid above, pub. beneath. 346

Branches and underside of L. white mealy tom. L. lanc. 3″—5″ long, acute, gl. above. 378

Undershrubs not exceeding 4′ in height.

Branches and leaves stellately pubescent.

Erect undersh. 1′—4′, branches grey hoary-tom. L. ovate, 2″—5″ long, pub. 408

Pubescence on stems and leaves not stellate.

Glandular pub. undersh. 1′—2′; stems many from root, angled. L. ovate, 1″—2″ long, glabrescent, acute. 423

Glandular pub. undersh. 1′—2′, similar to 423, but leaves pub. 424

Straggling, branchy, hoary-pub. undersh. 1′—2′. L. ovate ½″—1½″ long, obtuse, pub. 425

Undersh. with woody root-stock. Stems annual 1′—2′. L. ell. 2″—3″ long, acute, pub. 426

Spreading hairy undersh. 1′—3′. Stem herbaceous. L. lanc. or ell. 2″—5″ long, acute or acum. hairy. 437

I. A. (2) (b) (ii) *a*.

L. glabrous at least on the upper surface.

L. with minute peltate or glistening glands on lower surface, visible by reflected light.

L. penninerved or palminerved.

Lge. sh. L. ovate, 3″—6″ long, more or less serr. aromatic, minutely pub. beneath. Pet. 1″—2″. 446

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Serial No.

Lge. sh., bark yellowish-brown. L. ovate or rhomboid, $1\frac{1}{2}''$—$2\frac{1}{2}''$ long, more or less crenate-dent., minutely pub. beneath. Pet. $\frac{1}{4}''$—$\frac{3}{4}''$. 452

L. penninerved.

Erect sh. 3′—6′. Stems quad. mostly herbaceous from woody root-stock. L. ell. 5″—10″ long, coarsely serr. gl. 453

L. without glands.

Lge. sh. 8′—12′. Branches and underside of L. white mealy tom. L. lanc. 3″—5″ long, acute, serrulate. 378

Sm. sh. 3′—5′. Stems many, bark exfoliating in papery strips. L. ovate, 2″—4″ long, acum. serr. gl. 427

Undersh. 2′—4′. Stems herbaceous. L. oblong-lanc. 5″—8″ long, acum. crenulate, base decurrent into pet. 428

I. A. (2) (b) (ii) β.

L. pubescent or scabrid.

Branches armed with prickles.

Scrambling sh. with short recurved prickles. L. ovate, 2″—3″ long, serr. scabrid, pub. 441

Branches unarmed.

Straggling or more or less scandent shrubs.

Branches quad. L. ovate, 1″—3″ long, serrate, pub. ... 442

L. ovate, 2″—4″ long, crenate, acum., somewhat pub. ... 456

Shrubs more or less erect, never scandent.

L. rough, not gland-dotted beneath. One L. of each pr. often smaller than the opp. one.

Lge. sh. 6′—15′, stems rigid, tubercled. L. ell.-lanc. 4″—9″ long, base tapering, crenate, hairy. Pet. 1″—3″. 430

Sm. sh. 2′—6′, branches quad. gl. L. ell.-lanc. 3″—10″ long, crenate, sessile, base auriculate, softly hairy. 431

M. s. sh. 4′—8′, branches hispid. L. broadly ovate, 2″—7″ long, acum., crenate, hispid. 432

L. minutely gland-dotted beneath (often obscured by pubescence.) Each of a pr. of L. of equal size.

L. densely white tomentose beneath.

Sm. pub. undersh. L. ovate, 1″ long, crenate-serrate, rugose above. 461

Lge. sh. 5′—10′, branches grooved. L. ell.-lanc. 4″—8″ long, crenulate. 464

L. more or less pubescent.

M. s. sh. 4′—6′; stem quad. fulvous-hairy. L. palminerved, ovate-cordate 4″—8″ long, denticulate. 454

M. s. aromatic sh. 4′—6′; branches often purple. L. ovate 2″—5″ long, serrate. 463

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I. B. (1) (a).

Margins of lobes entire.

Serial No.

Unarmed.

L. deeply 2-lobed at the apex.

Lge. sh. 8′—15′. L. 2″—3″ long, nearly as broad as long. Bas. n. 7—9. 228

L. angled or more or less deeply 3—5 lobed.

L. glabrous.

Lge. soft wooded sh. 10′—15′. L. 4″—7″ diam., 3—5-angled or lobed. 492

Sm. sh. 3′—5′; branches and L. at first purplish-brown. L. 3″—8″ diam., 3—5-lobed. Pet. clothed with gland tipped bristles. 493

L. pubescent or tomentose.

Sm. sh. 4′—6′. L. 3″—6″ long, 3-lobed, base cordate, stellately tom. beneath. 54

Cultivated erect sm. sh. L. 3—5-lobed, divided to the middle (Cotton plant). 56

Branches and L. furnished with prickles.

Undersh. 1′—4′. L. sinuate to pinnatifid, penninerved, 1″—5″ long, densely woolly beneath. 407

I. B. (1) (b).

Margins of lobes not entire.

Leaves 2-glandular at the base.

Undersh. 3′—6′, stems many, herbaceous. L. variable upper lanc., lower 6″—10″ diam., 3—5-lobed, sinuate-toothed. 498

Leaves without glands.

Herbaceous undersh. 2′—4′. L. 4″—6″ diam., slightly lobed, serr., stellately hairy 39

Undersh similar to 39, but L. 1″—3″ long, and 3—5-lobed to below the middle. 40

Shrub 5′—8′, stellately hairy. L. broadly ovate, 4″—6″ long, more or less 3—5-lobed towards the apex, irregularly serr. 76

Pub. undersh 2′—4′. L 2′—3′ long, 3-lobed (upper L. often simple) irregularly serr. 79

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I. B. (2) (a) (i) β *.

Armed with stipular thorns or branchlets ending in spines.

Serial No.

Branches armed with stipular thorns.

Branchy lge. sh. L. ovate-lanc. 1½″—3″ long, coriaceous, gl. Thorns straight. — 21

Branchy lge. sh. Branches smooth, green, almost leafless L. very small linear, cadu. Thorns straight. — 22

Branchy lge. sh. often scrambling. Branchlets green. L oblong-ell. 1″—2″ long, pub. beneath. Thorns hooked. — 25

Branchlets ending in spines.

Lge. sh.; branchlets often reddish. L. coriaceous, obovate, 1″—4″ long, crenulate, narrowed into pet. — 110

Lge. rigid sh.; branchlets angular. L. obovate, ½″—1½″ long, entire, glaucous. — 487

I. B. (2) (a) (i) β *** §§ †.

Large shrubs over 8 ft. in height.

Branchlets angular.

Erect sh., young shoots viscid with yellow resin. L. lanc. to oblanc. 1″—4″ long, gl. shining. — 131

Lge. sh.; branchlets sharply triangular. L ell. or obovate, 1″—1½″ long, gl. mucronate. — 477

Lge. spreading sh.; bark light coloured L. ell. or obovate, 1″—3″ long, obtuse, gl. — 486

Lge. sh. L. distichous, ovate or ell. 1″—1½″ long, gl. Stip. subulate, persistent. — 488

Branchlets not angular.

L. usually pubescent beneath.

Lge. sh.; branches light grey, spreading. L. ell. 2″—5″ long, gl above, rusty pub. beneath. — 332

Lge. sh.; L. ell. or obovate-lanc. 1½″—4″ long, gl. or slightly pub. beneath. L. turn brick red before falling. — 491

L. glabrous on both surfaces.

Much branched sh. L. ell.-oblong 1″—1½″ long, gl. mucronate. — 19

Lge. sh. L. obovate-oblong, 6″—10″ long, narrowed into short pet. — 333

Sarmentose sh. L. oblong or ell. ½″—1¼″ long Stip. subulate, hard. — 483

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GSL

I. B. (2) (a) (i) *s* *** §§ †††.

Undershrubs not exceeding 4 ft. in height.

Serial No.

Branches and leaves wholly glabrous.

Straggling undersh.; branches green striate. L. ovate 1½″—3″ long, pet. sheathing. 331

Procumbent. Stems reddish, woody below. L. lanc. 3″—9″ long, gland-dotted. Stip. sheathing. 468

Branches and leaves more or less pubescent, or silky hairy.

L. stipulate. Stipules large leafy.

Erect. undersh. Branches striate, sub-gl. L. oblong-lanc. 2″—6″ long, gl. above, silky beneath. 144

Stipules O or if present caducous.

Low undersh. Branches numerous. L. few, early decid. oblong ¼″—1″ long, silky. 145

Undersh. Branches angled, with appressed hairs. L. ovate-oblong, 3″—5″ long, gl. above, pub. beneath. 168

Undersh. Branches terete, fulvous-hairy. L. broadly-ovate, 3″—6″ long, pub. both surfaces. 169

Undersh. Much branched, stems woody below. L. lanc. 2″—3″ long, somewhat pub., sec. n. numerous. 291

Undersh. Branches erect or prostrate. L. linear or oblanc. ⅓″—1″ long, pub. on short arrested silky-pub. branchlets. 384

I. B. (2) (a) (ii) *s*.

Unarmed.

Juice milky.

Lge. sh. L. ell. or obovate, 2″—4″ long, irregularly dentate, rough onboth surfaces. Lowest pr. of sec. n. from near the base. 507

Juice not milky.

Leaves glabrous on both surfaces.

Lge. sh. L. narrow ell. 3″—4″ long, acum. finely serrate ... 118

Dwarf undershrubs with woody root-stock.

Branches numerous, sub.-herbaceous. L. oblanc. 3″—6″ long, spinous-serr. Stip. conspicuous. 99

Branches herbaceous. L. cuneate-obovate, 6″—8″ long, serrulate, at first red. Stip. O. 283

Leaves glabrous above, silky beneath when young.

Lge. sh.; bark rough, fluted. L. lanc. 1½″—3″ long, serrulate, white or glaucous beneath. 529

Herbaceous undersh. 2′—3′. L. very large, ovate-cordate, up to 2′, serr. mealy-white beneath. 128

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Serial No.

Leaves pubescent or rough with stiff hairs.

Rigid scabrid undersh. L. ell.-lanc. 3″—5″ long, serrate, rough with stiff hairs. 329

Erect sh. 4′—6′. Branches pub. L. ell.-lanc. 2″—5″ long, serr. narrowed into pet. scabrid above, pub. beneath. 330

I. B. (2) (b) (i) *a.*

L. with 3 bas. n. and penninerved above bas. n.

L. with small red glistening glands on the under surface.

Shrub 4′—8′; branches terete, pub. L. ovate-lanc. 2″—6″ long, gl. above, sec. n. 8—10 prs. 196

Shrub 4′—8′; branches angled, shaggy. L. ovate-lanc. 2″—6″ long, gl. above, sec. n. 4—6 prs. 197

Shrub. 4′—6′; branches terete, downy. L. ovate-cordate, 3″—6″ long, gl. above. 198

L. without glands. Branchlets spinescent.

Lge. sh. 6′—15′. L. ell. or oblong, 3″—6″ long, gl. above, sparsely pub. beneath. 312

I. B. (2) (b) (ii) *a.*

Armed with stipular prickles. Basal nerves 3.

Prickles in prs., one straight, the other curved.

Leaves serrulate.

Lge. sh. L. ovate, ¾″—2½″ long, densely tawny or white tom. beneath. 113

Lge. straggling sh. L. broad-ovate, 1½″—3″ long, white tom. beneath. Thorns often absent. 116

Leaves toothed at the apex.

Sm. sh. Branches divaricate, zigzag. L. orb. ½″—1″ long, grey-tom. beneath. 115

Prickles recurved, usually solitary.

Lge. straggling sh. Branchlets and L. beneath, ferrugineous-tom. L. ell. 3′—6′ long, serrulate. 117

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I. B. (2) (b) (ii) β *.

Petioles less than ½″ in length.

Serial No.

Basal nerves 3 (rarely 5 in 68).

Leaves glabrous on both surfaces.

Much branched sm. undersh. L. lanc. 1″—2½″ long, serr. base rounded. 36

Leaves glabrous above, tom. beneath.

Sm. undersh. L. more or less rhomboid, ¾″—1″ long, base tapering, serr. at apex. 37

Leaves stellately hairy or pubescent.

Erect sh. 3′—6′. Branchlets hoary. L. ovate-lanc. 3″—5″ long, serrulate, white hoary tom. beneath. 68

Sarmentose sh. Stems sharply 4-angled. L. lanc.-oblong, 2″—4″ long, serr. hairy. 75

Sm. tom sh. 2′—4′. L. lanc. 2″—3″ long, serrulate, hairy ... 77

Pub. undersh. 2′—4′. L. ovate to oblong, 1″—2½″ long, serr., softly pub. 67

Basal nerves 5—7.

Sm. undersh. with annual shoots, 1′—2′ from a woody root stock. L. roundish or obovate, 2″—3″ long, base cuneate, serr. Bas. n. 5 74

Lge. tom. sh. L. orb or obovate, 3″—5″ long, irregularly dent. stellately hairy Bas. n 5—7. 63

I. B. (2) (b) (ii) β ** §.

Leaves with 3—5 basal nerves.

L. with 1—3 small spines beneath the petiole.

Sm. branchy undersh. L ell., 1″—2″ long, crenate, base cuneate, hoary beneath. 35

L. without spines beneath the petiole.

Erect tom. undersh. 2′—4′. L. ovate-cordate, 1″—2″ long, crenate, downy on both surfaces. 38

Hairy undersh. 1′—3′. Branches herbaceous. L. ovate, 3″—5″ long (lower often 3 lobed), irregularly dent. stellately hairy. 45

Erect hairy undersh. 1′—3′. L. broad-ovate, 1″—2″ long, serr., scabrid, hairy. 46

Sm. undersh. 1′—3′. L. orb ¾″—1½″ across, irregularly dent. white tom. beneath. 80

Sh. with red bulbous hairs on stem. L. ovate-lanc. 3″—5″ long, serr. stellately hairy. 78

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I. B. (2) (b) (ii) β ** §§.

Leaves with 5 up to 9 basal nerves.

Serial No.

Basal nerves not exceeding 5.

Sm tom. sh. L. ovate-cordate, 2″—3″ long, serr. pub. both surfaces. 66

Herbaceous sh. 3′—6′, with red bulbous hairs on stem. L ovate-lanc. 3″—5″ long, serr. stellately hairy. 78

Basal nerves 7—9.

Petioles 3 —4″ long.

Erect undersh. 2′—4′. L ovate-cordate, up to 9″ long, irregularly dent., velvety. 41

Petioles 1″—3″ long

Hoary tom. undersh. 2′—4′. L ovate-cordate, 2″—3½″ long, dent., velvety. 42

Tom. undersh 2′—4′. L. broad-ovate, 3″—4″ across, dent., roughly pub. above, velvety beneath. 43

Similar to 43 but clothed with long spreading scattered hairs and sticky shorter hairs. 44

Lge. sh. 8′—15′. L. as broad as long, 4″—5″ across, coarsely dent, stellately hairy above, white tom. beneath. 65

I. C.

Leaves in whorls of 3 or more.

Margins of leaves entire.

Leaves in whorls of 4.

Sm. pub. undersh 1′—2′. Stems prostrate, rooting. L. unequal ell. to obovate 1″—2″ long 433

Leaves in whorls of 3 (sometimes 4 in 455).

L. dotted with black glands beneath.

Lge. bushy sh L. ovate-lanc. 2″—4″ long, sessile, finely pub. 287

L. not gland-dotted beneath.

Juice milky.

Lge. sh. 8—12′. L. linear-lanc. 4″—6″ long, gl. with numerous fine sec n. 355

Juice not milky.

Gl sh. 2′—4′ Branches herbaceous, hollow, channelled. L. linear-lanc. 6″—9″ long. 455

Margins of leaves not entire. L. in whorls of 3.

Erect sh. 3′—6′. Stems quad. mostly herbaceous. L. ell. 5″—10″ long, coarsely serr., gl. 453

Lge. sh. 5′—10′. Branches sub-quad., channelled, white tom. L. ell.-lanc 4″—8″ long, crenulate, white tom. beneath. 464

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II. B. (1).

Leaves paripinnate.

Serial No.

Leaves with conical or flat glands on rachis near base or between some of the lflts.
L. with 3—12 prs of lflts.
L. with lge. foliaceous ear-shaped persistent stipules
Pub. sh 3′—10′. Lflts. 8—12 prs. oblong, 1″ long, mucronate. 221
L. with small and caducous stipules
Gland solitary, inserted near base of rachis.
Undersh. 2′—3′. Lflts. 3—5 prs., ovate-lanc. 1″—4″ long, attenuated to acute apex. 217
Undersh 4′—7′. Lflts. 6—10 prs. lanc. 1½″—2½″ long, acute or acum. 218
Gland between each of the 2—3 lower prs. of lflts.
Lge. sh. Lflts. 4—6 prs, ell.-oblong. 1½″—3″ long, glaucous beneath. 225
L. with 40—60 prs. of leaflets.
Gland solitary inserted below lowest pr. of lflts.
Erect undersh. 1′—3′. Lflts. linear, ⅛″—¼″ long, unequal-sided, gl. 224
Leaves without glands on rachis.
L. with 1 pr. of lflts.
Lge. sh. with sharp ax. spines. Lflts. ell. or obovate, ¾″—1½″ long, coriaceous 96
L. with 10—20 prs. of lflts.
Lge. sh. 8′—12′. Lflts. linear-oblong, ½″—1″ long, gl. ... 153
L. with 20—30 prs. of lflts.
Annual sh. 5′—8′. Stems semi-woody, weak, prickly Lflts. linear-oblong, ⅜″—¾″ long. 154

II. B. (2) (a) (ii) *a.*

Margins of leaflets entire.

Lflts small, term. lflt. not exceeding 1½″ in length Lflts. exstipellate.
Undersh. 2′—3′. Branches hoary. Term lflt. largest, obovate-oblong. ¾″—1½″ long, clothed with fine appressed hairs. 147

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Serial No.

Undersh. 2′—3′ Branches slender. Lflts. linear-cuneate, ½″—1″ long, silky white beneath. 158

Lflts. m. s.; term. lflt. 1½″—6″ in length. Lflts. stipellate.

L. 1- and 3-foliolate intermixed.

Branches pubescent.

Undersh. 2′—4′. Term. lflt. twice the size of lat., ovate 2″—4″ long, blotched with yellow. 161

Undersh. 3′—4′. Term lflt. largest, broadly ell. 3″—5″ long, softly pub. beneath. 162

Branches glabrous.

Undersh. 2′—4′. Term. lflt. oblong-lanc. 2″—4″ long, lat. very small, silky pub. beneath. 170

L. all 3-foliolate. Branches angular.

Branches 3-angled, silky.

Sm. sh. 4′—8′. Lflts. ell.-lanc. 2″—4″ long, silky beneath. Sec. n. 10—14 prs. 164

Branches slightly angled or terete.

Branches downy or hairy.

Sm. sh. 3′—5′. Term. lflt. ovate-ell. 2″—5″ long, twice the size of lat. Sec. n. 8—10 prs. 165

Undersh. 2′—4′. Term. lflt. ell.-obovate, 1½″—2½″ long, sec. n. 6—8 prs. 167

Branches with short appressed hairs.

Undersh. 2′—4′. Term. lflt. ovate-ell. 3″—6″ long, sec. n. 7—12 prs. 166

II. B. (2) (b).

Leaves with at least 5 leaflets.

Margins of leaflets entire.

L. with from 5 up to 11 leaflets.

Stipules plumose, conspicuous.

Undersh. 2′—3′. Clothed with soft brown hairs. Lflts. 5—11, ell.-oblong, 1″—2″ long. 148

Stipules small, not conspicuous.

Sm. sh. 3′—5′. Stems silvery white. Lflts. 9—11, obovate, 1″ long, emarginate. 149

Undersh. 2′—3′. Branches silvery. Lflts. 9—11, oblong, ½″—1″ long, drying black. 150

Undersh. 2′—4′. Stems downy. Lflts. 5—7, linear-oblong, 3″—6″ long, blotched with yellow. 160

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Serial No.

L. with from 11 up to 21 leaflets.
M.s. sh. 4′—8′ Branches thinly pub. Lflts. 13 –21, ell.-oblong, 1″ long, thinly pub 151
Undersh. 1′—2′. Branches herbaceous. Lflts 11—21, oblanc. 1″ long, silky hairy beneath. 156
Undersh 1′—2′. Branches with white appressed hairs Lflts. 11—21, oblanc ½″—1″ long, silky beneath. 157
L. with 19—29 leaflets.
Tall erect sh Lflts. oblong 1″ long, obtuse, emarginate, almost gl. 210
L. with 21—71 leaflets
Annual undersh. 1′—3′. Stems green, gl. Lflts. alt minute, unequal-sided. 159
Margins of leaflets not entire.
Sh 3′—6′. Stems herbaceous, furrowed. Lflts 5—7, ell. 5′—8′ long, serr bifurcations of sec. n. running into the teeth. 129

II. B. (3).

Leaves twice pinnate.

Armed with prickles or stipular spines.
Prickles in pairs, straight (stipular)
Lge. sh. Pinnæ 4—8 prs. more or less pub Lflts. 10—20 prs., minute, gland below lowest pr. of pinnæ. 245
Bushy sh. quite gl. Pinnæ 2—4 prs. Lflts 5—10 prs, minute ... 248
Prickles numerous, scattered along the branches and on rachis.
Large scrambling shrubs.
Branches pub. Pinnæ 6—8 prs. Lflts 6—9 prs. ½′—1″ long. Stip. lge foliaceous 213
Branches pub. Pinnæ 5—10 prs. Lflts. 8—12 prs. ½″—¾″ long. Stip. semi sagittate, decid. 214
Weak straggling shrubs; stems numerous.
Branches downy. Pinnæ 5—11 prs. Lflts. 8—15 prs ¼″ long. Stip. small. 242
Similar to 242, but leaf rahcis less prickly. Pinnæ 3—6 prs. Lflts. 6—10 prs 243
Prickles few, scattered along the branches. Rachis not prickly.
Lge. gl sh. Pinnæ 6—8 prs. Lflts. 8—12 prs. ½″—¾″ long. 215
Diffuse undersh clothed with long bristly hairs Pinnæ digitate 2—4 prs., sensitive. Lflts. 12—20 prs. 244
Unarmed. Lower L. 2-pinnate. Lflts. serrate.
Sh. 3′—6′. Stems herbaceous, furrowed. Lflts. 5—7 ell., 5′—8′ long, bifurations of sec. n. running into the teeth. 129

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GROUP KEY.

Climbers and Creepers.

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GROUP KEY.

Climbers and Creepers

KEY.	Serial No. of species.	Ref. p. for sub. key.
I. Stems more or less distinctly woody. Root-stock perennial.		
A. Leaves simple.		
(1) Leaves opposite.		
(a) Leaves lobed. Palminerved.		
Tom. cl. L. simple, 1″—2″ long, or ternate, 1—3-toothed or lobed. Pet. twining.	2.	
(b) Leaves not lobed.		
(i) Leaves penninerved. Margins of L. entire.		
α. Juice milky.	354, 356, 362, 363, 369, 374.	69.
β. Juice not milky.	84, 274, 275, 277, 341, 342, 343, 456.	69.
(ii) Leaves palminerved. Margins of L. entire.		
α. Juice milky.	367, 368, 371, 372, 373	70.
β. Juice not milky.		

Gl. cl. L. ovate, 4″—8″ long, acute, gl. Bas. n. 5—9. Pet. woody, twining.	1.	
Tom. cl. L. orb. 4″—7″ diam. cordate, abruptly acum.	85.	
(2) Leaves alternate.		
(a) Leaves lobed; palminerved. Furnished with tendrils.		
L. furnished with circular glands near apex of pet. beneath.		
Woody below with annual herbaceous branches. L. 3—5-lobed, 2″—5″ across, scabrous above, lobes dentate.	296.	
L. not furnished with glands.		
Lge. cl. L. 2-lobed at apex, orb.-cordate, 4″—12″ diam. Bas. n. 12—15.	232.	
(b) Leaves not lobed.		
(i) Leaves penninerved.		
a. Margins of leaves entire.	18, 24, 25, 26, 108 112, 119.	70.
β. Margins of leaves not entire.		
Lge. cl.; branches lenticellate. L. obovate, 2″—4″ long, serrulate, gl.	109.	
Lge. cl.; branches green, ribbed. L. ovate, 2″—4″ long, crenate-serr., gl.	112.	
(ii) Leaves palminerved.		
a. Margins of leaves entire.		
* Juice milky.		
Twiner. Branches and L. strigose-hairy. L. ovate-cordate 3″—6″ long.	389.	

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KEY—(*continued*).	Serial No. of species.	Ref. p. for sub. key.
Climber, rooting at the nodes. L. ovate 3″—5″ long, rough. Bas. n. 3.	520.	
** Juice not milky.		
§ Leaves glabrous.	12, 14, 469, 542.	71.
§§ Leaves pubescent or silky hairy, at least beneath.	13, 14, 385, 386, 387, 388, 403, 405.	71.
β. Margins of leaves not entire.		
Armed with stipular prickles.		
Lge. cl. L. ovate, oblique, 1″—2½″ long, denticulate. Bas. n. 3—4.	114.	
Sarmentose or climbing. L. ell. oblique, 3″—6″ long, serrulate. Bas. n. 3.	117.	
Unarmed. Furnished with tendrils.		
Lge. cl. with thick corky bark. L. broadly ovate-cord. 3″—7″ long, margins repand, tom. beneath.	121.	
B. Leaves compound.		
(1) Leaves opposite.		
(a) Leaves 3-foliolate.		
Pub. climber. Term. lflt. ovate, 1″—2″ long, lat. lflts. very small, often wanting.	343.	
Tom. climber. Lflts. ovate, 1″—2″ long, usually 3-lobed. Pet. twining.	2.	

(b) Leaves bi- or 3-pinnate. Lflts. palminerved.		
Lge. gl. cl. Lflts. ovate-cordate, 1″—4″ long, entire or coarsely serr. Pet. twining.	3.	
(2) Leaves alternate.		
(a) Leaves paripinnate.		
Branches slender, twining. Lflts. 10—20 prs., ½″ long. Common pet. terminating in a short bristle.	171.	
(b) Leaves imparipinnate.		
(i) Leaves 3-foliolate.	124, 171a, 177, 179, 181, 191, 192, 194, 195.	72.
(ii) Leaves with at least 7 leaflets.		
Branches often twisted into spiral hooks.		
Lge. cl. Lflts. 9—13, ell. 1″—2″ long, obtuse, gl.	206.	
Branches not twisted into spiral hooks.		
Lge. cl. Lflts. 7—9, obovate-oblong, 3″—6″ long, silky beneath.	152.	
Lge. evergreen cl. Lflts. 9—11, ell.-lanc. 1″—3″ long, gl. and shining above.	209.	
(c) Leaves bi-pinnate. Branches armed.	213, 214, 253, 254, 255.	73.
(d) Leaves digitately 5—7-foliolate.		
Furnished with tendrils.		
Lge. cl. Bark corky. Lflts. 5, obovate, serr. Stip. large ear-shaped.	126.	
Without tendrils.		
Lge. woody cl. Lflts. 5—7, ell.-oblong, entire. Stip. connate.	311.	

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KEY—(*continued*).	Serial No. of species.	Ref. p. for sub. key.
C. L. reduced to scales bearing in their axils tufts of needle-like branchlets (cladodes). Spinous.		
Rambling and climbing. Root-stock tuberous. Cladodes ½″—1″ long, green, in tufts.	543.	
II. Stems and branches herbaceous, mostly annual. Root-stock annual, or perennial, or tuberous, sending up annual stems in the rainy season.		
A. Leaves simple.		
(1) Leaves opposite.		
(a) Juice milky, L. entire.	363, 366, 367, 370, 375.	73.
(b) Juice not milky, L. entire.	536, 537, 538, 541.	74.
(2) Leaves alternate.		
(a) L. strongly angled, or more or less deeply 3—7-lobed. Palminerved		

(i) Climbers furnished with tendrils.		
a. Tendrils simple.	120, 122, 300, 301, 302, 303, 304, 305, 306, 308, 309.	74.
β. Tendrils forked, 2—3-fid.	123, 296, 297, 298, 299, 307.	75
(ii) Twiners not furnished with tendrils.		
Stems and L. hairy. L. ovate-cordate, 2″—5″ diam., 3-lobed.	390.	
Stems and L. hairy. L. 2″—4″ diam., more or less deeply 5—9-lobed, rarely entire.	394.	
(b) L. not lobed.		
(i) L. penninerved.		
Fleshy, gl. tw. L. broad-ovate, 2″—5″ long, thick, entire.	466.	
(ii) L. palminerved.		
a. Stems more or less prickly below.		
Twiner, root not tuberous.		
Stems muricate. L. ovate-cordate, 3″—6″ long, acute, gl.	391.	
Tw. with annual stem developing from large tubers.		
Stems prickly. L. broad ovate-cordate, cuspidate, gl.	537.	
β. Stems not prickly.	14, 387, 391, 392, 395, 396, 397, 402, 403, 404, 536, 538.	75.

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KEY—(*continued*).	Serial No. of species.	Ref. p for sub. key.
B. Leaves compound.		
(1) Leaves alternate.		
(a) Leaves imparipinnate.		
(i) Leaves 3-foliolate.		
a. Weak climbers with herbaceous stems and forked tendrils. Lflts. crenate or dentate.		
Perennial. Lflts. ovate-ell. 1½″—2″ long, pub. Common pet. 1″—2″.	124.	
Succulent, clothed with glandular bristly hairs. L. sessile. Lflts. thick, fleshy.	125.	
β. Twiners without tendrils. Lflts. entire.		
* Twiners with annual stems, prickly below, from tuberous roots. Lflts. exstipellate.		
Lflts. obovate, caudate-acum., palminerved, lateral lflts. very oblique.	534.	
Lflts. obovate, acum., penninerved, lateral lflts. oblique.	535.	
** Annual or perennial twiners. Lflts. usually stipellate. Stems not prickly.		
§ Leaflets gland-dotted beneath.		
Stems slender, tom. Lflts. rhomboid-obovate, 2″—3″ long, stipellate.	189.	
Stems slender, grey pub. Lflts. ell. 1″—1½″ long, sub-acute, pub. exstipellate.	190.	

Stems slender, pub. when young. Lflts. rhomboid-ovate, ½″—1″ long, apiculate, gl. above.	193.	
§§ Lflts. not gland-dotted beneath.	172, 173, 176, 180, 182, 183, 184, 185, 187, 188.	76.
(ii) Leaves with at least 5 lflts.		
Perennial twiner, stems terete. Lflts. 5—7, ell.-oblong, 1″—2″ long, gl. stipellate.	186.	
Twiner from tuberous root; stems prickly below. Lflts. 5, obovate, 3″—5″ long, acum. gl.	535.	
(b) Leaves twice ternate. Lflts. inciso-serrate.		
Slender cl. Branches striate. Segments of L. lanc.-acute. Circinnate tendrils on fl. peduncles.	133.	
(c) Leaves digitate.		
Annual hairy tw. Lflts. 5, broadly lanc. 2″—4″ long, acum.	393.	

III. Slender filiform leafless parasites, living by suckers on other plants.

Stems branched, gl., fleshy, pale greenish-yellow.	406.	

TS

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CSL

SUBSIDIARY KEYS TO GROUP KEY FOR CLIMBERS AND CREEPERS.

I. A. (1) (b) (i) α.

Juice milky.

Serial No.

Lge. woody climbers.

Bark of old stems deeply cracked, corky. Branches ash-coloured.

L. ell.-oblong, 2″—4″ long, acum. gl. A circle of small cylindric glands above insertion of pet. — 354

Branchlets and underside of L. minutely pub. L. ovate, 1½″—3″ long, acute, gl. above. — 374

Bark not corky.

Bark of stems and branches papery, purplish-brown, glabrous.

L. ell.-oblong, 3″—5″ long, pale glaucous beneath. Sec. n. fine, numerous, united into an intramarginal nerve. — 362

Young stems and branches densely pubescent. Branches numerous.

Branches rusty. L. ell.-oblong, 2″—4″ long, shortly acum. gl. above. — 356

L. ovate to ell. 1″—2″ long, shortly acum. pub. Lowest pr. of sec. n. very near base. — 369

Slender semi-herbaceous twiner. Stems gl. or pub.

L. linear to ell.-oblong, 2″—4″ long, pale beneath, with pale central streak above. — 369

I. A. (1) (b) (i) β.

Juice not milky.

L. with small sunk scales or glands on the under surface.

Lge. woody cl. Shoots and L. beneath rusty pub. L. ell. 2½″—5″ long, acum. pub. — 277

Lge. woody, almost gl. cl. L. ell. 3″—5″ long, acum. gl. ... — 275

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Serial No.

L. not furnished with scales or glands beneath.

Lge. woody cl. Shoots appressed tom. L. ell. 4″—7″ long, acute or acum. gl. shining. 84

Lge. woody cl. Shoots silky. L. ell.-oblong, 3″—6″ long, abruptly acum. gl. when mature. 274

More or less scandent, branchlets grey-tom. L. ovate, 1″—3″ long, base rounded, pub. 341

Erect or climbing ; branchlets grey-pub. L. ovate, 3″—5″ long, acute, gl. when mature. 342

Cl. and twiner. L. 1-foliolate, ovate, 1″—2″ long, mucronate, more or less pub. 343

Straggling and climbing. L. ovate, 2″—4″ long, entire or crenate, acum. somewhat pub. 456

I. A. (1) (b) (ii) *a.*

Juice milky.

Base of L. cordate with a deep sinus and rounded lobes.

Branches and leaves pubescent.

Slender cl. fœtid when crushed. Stems hairy. L. orb. 2″—4″ long, acum. 367

Lge. tw. Bark grey, corky. L. broad-ovate, 4″—7″ long, shortly acum. velvety pub. 371

Branches and leaves glabrous.

Lge. gl. cl. L. ovate, 3″—5″ long, acum., gl. above, puberulous below. 368

Base of L. rounded or only slightly cordate.

Leaves more or less pubescent.

Lge. tw. Stems, ash-coloured, lenticellate. L. ovate 2½″—6″ long, acum. glandular at base of midrib. 372

Leaves glabrous, at least when mature.

Lge. tw. Bark corky. L. ovate-cordate, 2″—4″ long, acum. gl. 373

I. A. (2) (b) (i) *a.*

Margins of leaves entire.

Branches armed with stipular recurved prickles.

Scrambling or climbing. Branches flexuose, gl. L. ovate-lanc. 1″—2″ long gl. 24

Scrambling and climbing. Branches green, pub. L. oblong-ell. 1″—2″ long, emarginate, pub. beneath. 25

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Serial No.

Lge. climber. Shoots and young L. rusty pub. L. ell.-oblong to obovate 1½″—3″ long, obtuse, mucronate, shining above. 26

Unarmed.

Furnished with circinnate tendrils.

Slender gl. cl. Branchlets ending in tendrils. L. ovate or lanc. 2″—3″ long. 119

Not furnished with tendrils.

Woody cl. Bark light grey. L. ell. 1″—3″ long, obtuse, mucronate, gl. 18

Lge. cl. Branches green, ribbed, often pub. L. ovate 3″—5″ long entire or crenate, gl. 112

Lge. cl. Bark dark grey. L. ovate-oblong, 2″—3″ long, obtuse, gl. above, slightly pub. beneath. 108

I. A. (2) (b) (ii) $_a$ ** §.

Leaves glabrous.

Stems prickly. Pet. with 2 tendrils at base.

Lge. cl. L. orb. or broadly ovate, 3″—8″ long. Bas. n. 5—7 uniting at apex. 542

Stems not prickly. Tendrils absent.

Basal nerves 5—7.

Lge. cl. Bark corky. L. ovate-cordate, 1″—2½″ long. Pet. 1″—2″ 12

Slender. Branches gl. or pub. L. peltate, orb.-reniform, 1½″—4″ diam. 14

Basal nerves 3, short.

Twining, woody below. Stems striate, gl. L. linear to obovate-oblong, 2″—5″ long. 469

I. A. (2) (b) (ii) $_a$ ** §§.

Leaves pubescent or silky hairy, at least beneath.

Branches and underside of L. clothed with appressed silky-white hairs.

Lge. cl. Branchlets silky-pub. L. orb.-cordate, 1½″—4″ long, gl. above, silky hairy beneath. Peduncles 1—2-fld. 386

Lge. cl. Similar to 386, but sepals larger and peduncles 3—7-fld. 385

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Serial No.

Lge. tw. Stems hairy. L. ovate-cordate, 3″—6″ long, hairy above, silky-white beneath. 387

Lge. woody cl. Branches and underside of L. silvery-white tom. L. ovate-cordate 3″—12″ long, gl. above. 388

Branches and underside of L. gl. or pub. not silky hairy.

Slender. Branchlets grey-tom. L. deltoid, 1″—3″, long, villous 13

Slender. Branchlets more or less pub. L. peltate or orb.-reniform 1½″—4″ diam., pub. when young. 14

Sm. tw. Stems sub-woody, gl. or pub. L. ovate 1½″—3″ long, acum. almost gl. 403

Lge. cl. Branches and underside of L. softly grey-pub. L. ovate-cordate 3″—5″ long, acum. pub. 405

I. B. (2) (b) (i).

Leaves 3-foliolate.

Leaflets gland-dotted beneath. Glands yellow. M. s. woody twiners.

Stems and branches downy. Lflts. 2″—4″ long, term. rhomboid, acute, velvety pub. Stipels minute. 191

Stems and branches grey or rufous pub. Lflts. 2″—4″ long, term. rhomboid, acum., velvety pub. Stipels large. 192

All parts grey viscous pub. Lflts. 1½″—3″ long, term. rhomboid 194

Stems and branches soft grey pub. Lflts. 2″—4″ long, term. rhomboid, obtuse, densely pub. 195

Leaflets not gland-dotted beneath.

Weak sub-succulent climber with branched tendrils.

Woody at base. Lflts. ovate-ell. 1½″—2″ long, crenate, pub. ... 124

Very lge. woody climbers; stems 1–2 ft. girth, exuding red juice when cut.

Twining right to left. Lflts. 4″—6″ long, lateral unequal-sided, gl. above, silky beneath. 177

Twining left to right. Lflts. 6″—12″ long, coriaceous, lateral oblique-ovate, silky beneath. 179

M.s. or slender twiners. Juice of stems not red.

Stem tubercled. Roots tuberous. Lflts. 5″—8″ long, lateral very oblique, silky beneath. 181

Slender tw. Term. lflts. rhomboid-obovate, 1″—1½″ long, lateral smaller, more or less pub. 171*a*

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I. B. (2) (c).

Leaves bi-pinnate. Branches armed.

Serial No.

Armed with prickles on the branches and often on leaf rachis.
Rachis with large gland near the base, and smaller ones between upper pinnæ.
Lge. gland half way between base of rachis and 1st pr. of pinnæ.
Lge. cl. Pinnæ 4—6 prs. Lflts. 12—20 prs., ⅓″—½″ long, unequal-sided, gl. 253
Lge. cl. Pinnæ 10—20 prs. Lflts. 20—40 prs., ⅙″—⅓″ long, unequal-sided, gl. 255
Lge. gland immediately above base of rachis.
Lge. cl. Pinnæ 6—16 prs. Lflts. 10—30 prs. ¼″ long, unequal-sided, pub. beneath. 254
Rachis eglandular. Branches pub.
Pinnæ 6—8 prs. Lflts. 6—9, ½″—1″ long. Stip. lge. foliaceous, mucronate. 213
Pinnæ 5—10 prs. Lflts. 8—12 prs., ½″—¾″ long. Stip. semi-sagittate, decid. 214

II. A. (1) (a).

Juice milky. Leaves entire.

Leaves palminerved.
Base of L. cordate with a deep sinus, and rounded lobes.
Slender cl. fœtid when crushed. Stems hairy. L. orb. 2″—4″ long, pub. 367
Base of L. sub-cordate or rounded.
Stems slender, pub. L. broadly-ovate to orb., 1″—2½″ long, gl. above, pub. beneath. 370
Leaves penninerved.
Slender tw. Stems gl. or pub. L. linear to ell-oblong 2″—4″ long, pale beneath, with pale central streak above. 363
Stems annual, numerous, slender, gl. L. linear-lanc. 2″—4″ long, acute, gl. 366
Stem annual from a turnip-shaped tuberous root. L. thick, fleshy, variable orb. and stalked, 2″—3″ long, or linear and sessile 4″—8″ long. 375

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II. A. (1) (b).

Juice not milky. Leaves entire.

Serial No.

Twiners with annual stems developing in the rains, from large tubers. Leaves palminerved.
Stems prickly, at least below.
L. broadly ovate-cordate with 9 bas. n. Base of pet. thick and hard 537
Stems not prickly.
Stems glabrous with brown ax. bulbils.
L. broadly ovate-cordate, acum. 3″—10″ long, and 10—12 conspicuous bas. n. 536
Stems glabrous, not bulbiferous.
L. ovate-oblong, 2″—5″ long with conspicuous cartilaginous margins. Bas. n. 3—5. 538
Climber with annual stems from branched tubers. Tip of L. ending in tendril-like spiral.
L. ovate-lanc. 3″—6″ long, acum. gl. 541

II. A. (2) (a) (i) *a*.

Tendrils simple.

Stems long, quad., winged, fleshy, contracted at the nodes.
L. ovate or 3—7-lobed, 1″—2″ long, denticulate, gl. ... 120
Stems not or only slightly angled, as a rule slender, not fleshy.
L. dotted with translucent glands.
Roots tuberous. Stems furrowed, gl. L. broadly-ovate, 1″—3″ long, more or less 3—5-lobed, denticulate, gl. 301
Roots tuberous. Stems striate, almost gl. L. orb. 1″—2″ diam. slightly 5—7-lobed, gl. 302
Root thick. Stems furrowed, gl. L. 5-angled or 5-lobed, 2″—4″ long, denticulate, with conspicuous circular glands between bas. n. beneath. 306
L. not gland-dotted.
L. scabrid.
Stems angled, scabrid. L. orb. 1″—2″ diam. deeply 5—7-lobed, denticulate, scabrid both surfaces. 303
Root tuberous. Stems furrowed, gl. L. very variable, ovate, deeply 3—5-lobed or hastate, denticulate, scabrid above. 304
Annual. Stems angular, hispid. L. deltoid-ovate, 1″—3″ long, entire or 3—5-lobed, dent., scabrid above. 305
Stems striate gl. L. orb. 1″—2″ diam. 3—5-lobed, denticulate, with rotundate stipular bracts fringed with filiform cilia. 309

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CSL

Serial No.

L. pubescent.
Stems dying down annually to the perennial root.
Stems and branches grey or fulvous-pub. L. ovate 3—5-lobed, coarsely toothed, densely tom. 122
Small annual climbers.
Stems angled, pub. L. orb. 1″—3″ diam., deeply 5—7-lobed spinous-dent. 300
Stems striate, gl. L. deeply 3—5-lobed, 2″—3″ long, ash-coloured beneath. 308

II. A. (2) (a) (i) β.

Tendrils forked, 2—3-fid.

Extensive climbers, stems dying down annually to the perennial root.
Stems weak, gl. L. as broad as long, 3—7-lobed, irregularly dent. gl. 123
Stems stout, gl. L. 3—5-lobed, 2″—5″ across, scabrous above, with scattered circular glands beneath. 296
Annual climbers.
Extensive. Tendrils 3-fid.
Stems 5-angled, gl. L. orb. 6″—8″ diam. 5-angled or lobed, villous when young, then scabrid. 298
Stems slender, furrowed. L. sub-reniform, 2″—5″ diam. distantly denticulate, gl. above. 297
Small. Tendrils 2-fid.
Stems slender, furrowed. L. similar to 298 but only 1½″—2½″ across. 299
Stems slender, grooved. L. 3″—6″ across, deeply 5-lobed, margins sinuate, distantly denticulate, scabrid above. 307

II. A. (2) (b) (ii) β.

Stems not prickly.

Lge. twiners developing in rains from lge. tubers.
Bulbils in leaf axils.
L. broadly ovate-cordate, acum. 3″—10″ long, 10—12 conspicuous bas. n. 536
Leaf axils not bulbiferous.
L. ovate-oblong. 2″—5″ long, with cartilaginous margins. Bas. n. 3—5. 538

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Serial No.

Extensive twiners. Flowers showy, convolvulus type.

Base of L. distinctly cordate.

Stems hairy. L. ovate-cordate, 3″—6″ long, hairy above, silvery-white below. 387

Stems muricate. L. ovate-cordate, 3″—6″ long, gl. ... 391

Base of L. rounded or truncate.

Stems gl. L. ovate, the upper often lanc. 5″ long, gl. ... 396

Stems quad. winged, pub. L. ovate, 2″—4″ long, slightly pub. 397

Small annual or perennial twiners.

L. more or less cordate.

Stems hairy. L. ovate-cordate, 2″—3″ long, acum. sparsely hairy. 392

Stems usually gl. purple when young. L. ovate-cordate, 1″—3″ long, acute, gl. 395

Stems gl. or pub. L. ovate, 1½″—3″ long, acum., almost gl. Base slightly cordate. 403

L. hastate.

Root-stock creeping. Stems trailing. L. lanc.-hastate, 1″—2½″ long, gl. 402

Stems hairy. L. hastate 1″—3″ long, pub. 404

L. peltate or orb.-reniform.

Slender herbaceous branches from a creeping rhizome. L. 1½″—4″ diam., pale beneath. 14

II. B. (1) (a) (i) β ** §§.

Leaves not gland-dotted beneath.

Extensive and tall twiners. Lflts. mostly palminerved.

Lflts. glabrous at least above.

Stems slender, appressedly hairy. Lflts. ovate or rhomboid, 1½″—2″ long, sub-acute, hairy beneath. 172

Stems slender, slightly pub. Lflts. ell.-oblong, 1″—2″ long, obtuse, silky beneath. 176

Stems stout, gl. Lflts. ovate, 2″—3″ long, acute or acum., gl. both surfaces. 180

Lflts. pub. or silky-hairy.

Slender. Lflts. rhomboid-ovate, 3″—5″ long, lateral very oblique, pub. above, silky-hairy beneath. 173

Slender. Lflts. broad-ovate, 2″—6″ long, pub. Bas. n. 5. Stip. persistent, basifixed. 187

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Serial No.

Dwarf twiners, or sub-erect, or stems trailing. Palminerved.
Stem prostrate not twining. Lflts. lobed.
Stems wiry. Lflts. as broad as long, ½″—1″ long, 3-lobed, gl. 182
Stem twining or sub-erect. Lflts. not lobed.
Stipules attached above the base.
Stems slender, with rufous hairs. Lflts. 1½″—3″ long, silky hairy both surfaces. Bas. n. 3 conspicuous. 183
Stems slender, with brown silky hairs. Lflts. 2″—4″ long, somewhat hairy. 184
Stipules basifixed.
Stems slender, hairy. Lflts. ovate, 1″—2″ long, acute, pub. 188
Stems sub-gl. Lflts. ovate, 2″—4″ long, acute, somewhat appressedly hairy. 185

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ERRATA.

PAGE

1 Under Clematis smilacifolia. For "Br. 2" read "Br. 1."

14. For "Dipterocapeæ" read "Dipterocarpeæ."

55. Delete "Sapindaceæ" and insert "Sapindaceæ" on p. 54 above Schleichera trijuga.

59. Under Spondias mangifera. For "San." read "Sau."

63. Under Millettia auriculata. For "Br. 219" read "Br. 220."

79. Under Rhynchosia minima. For "leaflets 1—2 in." read "leaflets ½"—1"."

81. Under Flemingia bracteata. For "shrub 1—3 ft." read "shrub 4—8 ft."

82. Under Flemingia congesta. For "C. 392" read "C. i. 392."

110. Under Terminalia chebula. For "eiliptic" read "elliptic."

159. For "Boroginaceæ" read "Boraginaceæ."

176. Under Daedalacanthus roseus. For "F. B. I. vi. 419" read "F. B. I. iv. 419."

190. Under Lavandula Burmanni. For "C. i. 452," read "C. ii. 452."

218. Under Curculigo orchioides. For "radicle" read "radical."

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LIST OF SPECIES.

RANUNCULACEÆ.

1. **Clematis smilacifolia,** *Wall.* F. B. I. i. 3; Br. 2; G. 2; C. i. 2. Vern. *Pasaran* (Man.).

A woody climber. Leaves usually 1-foliolate, opp.; petioles twining, woody. Leaflets glabrous, ovate, 4-8 in. long, acute, usually 7-nerved from the base. Fls. purple, 1-1½ in. diam., in long axillary panicles. Fr. Achenes with long feathery tails.

Fls. *Oct.-Nov*; fr. *Dec.-Jan.*

S. Man. (Amarkantak, 3,000 ft.).

A decoction of the stem is said to be used for rheumatism.

2. **Clematis triloba,** *Heyne in Roth.* F. B. I. i. 3; G. 2; C. i. 2. Vern. *Bandarsiti* (Chin.).

An extensive tomentose climber. Leaves opp., simple or once ternate, usually lobed. Fls. white, more than 1½ in. across. Fr. Achenes with long feathery tails.

Fls. *Sept.-Nov.*; fr. *Nov.-Jan.*

On high plateaux. Hosh. (Pachmarhi; Bori Res.); Mel. (Chikalda and Southern slopes); Ni.; Bet. (Kamla); Chin. (Amarwara R.).

3. **Clematis Gouriana,** *Roxb.* F. B. I. i. 4; Br. 2.; G. 2; C. i. 2. Vern. *Bandarsiti* (Chin.).

An extensive climber, usually glabrous. Leaves opp., 1-2-3 pinnate. Leaflets 1-4 in. long, ovate. Fls. small, scarcely ½ in. diam., yellowish-white in axillary panicles. Fr. Achenes with long feathery tails.

Fls. *Oct.-Nov.*; fr. *Dec.-Jan.*

S. Man. (Amarkantak, 3,000 ft.); Chin. (Umreth R.).

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GSL

4. **Dillenia indica,** *Linn.* F. B. I. i. 36; Br. 3; G. 4; C. i. 6; Watt. iii. 113.

A middle sized evergreen tree. Leaves simple, alt., oblong-lanceolate, 8-12 in. long, serrate. Fls. large, 6 in. in diam., white. Fr. 3-4 in. diam., round, hard.

Fls. *June-July*; fr. *Feb.*

Cultivated in gardens, Jub.

The thick sepals have an agreeable acid flavour and are eaten by natives.

5. **Dillenia aurea,** *Sm.* F. B. I. i. 37; Br. 4; G. 5; Watt iii. 112. Vern. *Kalle* (Gond.—Man.); *Kalla, karmata* (Gond.—Chin.).

A spreading tree. Leaves simple, alt., obovate, 6-12 in. long, crenate, narrowed into a sheathing petiole. Fls. yellow, solitary, 2-3 in. diam.

Fls. *Apr.-May*; fr. *May-June*; leaves fall, *Feb.-Mar.*; leaves renewed, *June.*

In Sal forests of the Bunjar Valley, S. Man.; Chin. (Sillewani R.).

6. **Dillenia pentagyna,** *Roxb.* F. B. I. i. 38; Br. 4; G. 6; C. i. 6; Watt. iii. 114. Vern. *Sua* (Gond.—Hosh.); *Karanbidi* (Mel.); *Kalla, kalli* (Gond.—Chin.); *Mirchi* (Baiga—S. Man.).

A middle sized tree. Leaves simple, alt., at the extremities of the branches, very large, 1-3 ft. long, serrate, tapering to the base. Fls. yellow, only 1 in. in diam. in fascicles from tuberosities on the 2-3 yr. old branchlets. Fr. size of a small nutmeg.

Fls. *Apr.-May*; fr. *June*; leaves fall, *Mar.-Apr.*; leaves renewed, *June.*

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Hosh. (Pachmarhi hills); Mel. (Khandu R.); Chin. (Sill-wani R.).

The fl., buds and fr. are eaten by natives.

MAGNOLIACEÆ.

7. **Michelia Champaca,** *Linn.* F. B. I. i. 42; Br. 8; G. 12; C. i. 7.; Watt. v. pt. i, 241. Vern. *Champa* (Hin.—Hosh.; Chin.); *Son champa* (Chin.).

A tall evergreen tree, with simple alt., lanceolate acute leaves 7-10 in. long. Fls. yellow, strongly scented, solitary, 2 in. across, each enclosed in the bud by a greyish-yellow, deciduous bract. Fr. a lax spike of woody carpels.

Fls. *Apr.-Sep.*; fr. *Dec.-Feb.*

Mahadeo hill, Pachmarhi, Hosh.; Chin.

Frequently planted near Hindu temples on account of the fragrant flowers. The bark and fls. are valuable as a tonic and febrifuge.

ANONACEÆ.

8. **Polyalthia longifolia,** *Benth. and Hk.* F. B. I. i. 62; Br. 15; G. 18; C. i. 12; Watt vi. 313. Vern. *Asok* (Hin.—Sau.; Jub.; Chin.; S. Man.; Hosh.).

A large evergreen tree. Leaves alt. narrowly lanceolate tapering to a fine point, margins undulate. Fls. yellowish-green, 1 in. across, on slender pedicels, fascicled. Fr. a cluster of numerous ovoid carpels on stalks ½ in. long, purple when ripe.

Fls. *Mar-May*; fr. *July-Sep.*

Cultivated as an ornamental tree, and planted in avenues and gardens. It deserves to be better known in the C. P. as an avenue tree.

Sau. (Public Gardens); Jub.; Chin.; S. Man.; Hosh.

The wood is used for drums in S. India. The fruit is eaten in times of scarcity.

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9. **Anona squamosa,** *Linn.* F. B. I. i. 78; Br. 22; G. 20; C. i. 14.; Watt. i. 259. Custard apple. Vern. *Sitaphal* (Hin.).

A small tree. Leaves alt. oblong-lanceolate, pellucid-dotted. Fls. greenish, single or in pairs. Fr. 2-4 in. in diam., the brownish-black seeds embedded in a white pulp.

Fls. *May-July;* fr. *Dec.-Jan.;* leaves fall, *Feb.-Mar.;* leaves renewed, *Mar.-Apr.*

Extensively cultivated on account of the edible fruit; run wild near old inhabited sites. Common throughout the area.

10. **Miliusa velutina,** *H. f. & Thoms.* F. B. I. i. 87; Br. 11.; G. 21. Vern. *Karai, kari* (N. C.; Berar); *Kutki* (Gond.—Jub.); *Domsal* (S. Man.).

A middle sized tree, leaves and fls. densely silky tomentose. Leaves simple, alt., twice as long as broad. Fls. on slender long stalks at the ends of short branchlets. Fr. of many ripe carpels ½ in. diam. on stalks ¼ in. long forming a round head.

Fls. *Apr.-May;* fr. *July-Aug.;* leaves fall, *Jan.-Feb.;* leaves renewed, *Apr.-May.*

Scattered but nowhere common, in the better class forests. Jub.; Sau.; S. Man.; Bet.; Yeo.; Mel.; Chin.; Seo.

The wood is easily worked and durable. It does not occur in sufficient quantities in these parts to be made use of. Elsewhere it is used for carts and agricultural implements.

11. **Saccopetalum tomentosum,** *H. f. & Thoms.* F. B. I. i. 88; Br. 11; G. 22; C. i. 16; Watt. vi. pt. ii, 381. Vern. *Kari* (Hin.—N. C.); *Um* (Ni.); *Homba* (Mar.—Berar).

A large straight growing tree. Bark dark brown with numerous deep longitudinal fissures.

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Leaves simple, alt. elliptic, pubescent. Fls. greenish-yellow, solitary or in pairs. Fr. of several dark purple succulent carpels on short stalks.

Fls. *Mar-May;* fr. *June;* leaves fall, *Jan.-Feb.;* leaves renewed, *Apr.*

Fairly commom in all Divisions, more especially on sandstone formations.

Wood yellowish, rather soft and little used. The wood is used for house construction in the Western Ghats.

MENISPERMACEÆ.

12. **Tinospora cordifolia,** *Miers.* F. B. I. i. 97; Br. 24; G. 24; C. i. 18; Watt. vi. pt. iv, 63. Vern. *Gulvel* (Mar.—Berar; Chin.); *Gurbel* (Hin.—Chin.); *Gurmai* (Sau.).

A large climber with grooved corky bark. Leaves alt. ovate-cordate, glabrous. Fls. small yellow in slender ax. racemes. Fr. of 1-3 drupes, size of a large pea, red, succulent

Fls. *Feb.-Apr.;* fr. *May-June;* leaves fall, *Jan.-Feb.;* leaves renewed, *May.*

Said to be common nearly all over India, but specimens have only been obtained in this area from Sau. (Mokalpur); Ak.; Mel.; Chin.; Ni. (Tapti river).

The root, stem and leaves are used in native medicine as a febrifuge, and as a valuable alterative and tonic.

13. **Cocculus villosus,** *D. C.* F. B. I. i. 101; Br. 26; G. 25; C. i. 21; Watt. ii. 397. Vern. *Wasan, wasan-ail* (Mar.—Berar); *Bochan* (Ni.).

A slender tomentose climber. Leaves alt. deltoid, 3-5 nerved from base, villous. Fls. minute yellowish; male fls. in axillary panicles; female fls. 2-3 in axillary clusters. Fr. composed of 3 purple drupes each the size of a pea.

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Fls. *Nov.-Jan.*; fr. *Dec.-Mar.*

Common in hedges throughout both circles. The leaves are eaten in times of scarcity.

The juice of the leaves mixed with water form a green jelly-like substance which is used in Bengal to thicken water-adulterated milk.

14. **Cissampelos Pareira,** *Linn.* F. B. I. i. 103; Br. 23; G. 26; C. i. 22; Watt. ii 327. Vern. *Pahadmul* (Mar.); *Safed padh, sethpal* (Sau.).

A pubescent climber. Leaves, alt. peltate or kidney-shaped. Fls minute, yellowish. Female fls. in the axils of large leaf-like bracts. Fr. a small hairy red drupe.

Fls. *July-Sep.*; fr. *Oct.-Dec.*

Jub.; Sau.; Chin.; Hosh.; Mel. and no doubt in other Divisions.

A decoction of the root and bark is used for stomach complaints, and applied externally in snake-bite and scorpion-sting.

BERBERIDACEÆ.

15. **Berberis asiatica,** *Roxb.*, var. Clarkeana, *C. K. Schn.* F. B. I. i. 110; Br. 29; G. 30; Watt. i. 444. Vern. *Daruhard* (Hosh.).

An erect shrub with yellow wood. Leaves simple, alt. thickly coriaceous, obovate, spinous, white beneath, fascicled in the axils of 3-5 fid. spines. Fls. yellow in short racemes. Fr. an ovoid red or black berry.

Fls. *Jan.-Feb.*

Scarce. Hosh. (Pachmarhi, 3,000 ft.).

An extract from the roots of various species of Berberis is obtained by boiling in water, and is of considerable commercial value in the Kashmir State where it is known as "rasaunt" and used for mixing with drinking water. It is also used as an application in ophthalmia and sun-blindness, and is a valuable tonic and febrifuge.

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PAPAVERACEÆ.

16. **Argemone mexicana,** *Linn.* F. B. I. i. 117; C. i. 27; Watt. i. 306.

An erect prickly annual with yellow juice, and sinuate-pinnatifid, variegated green and white leaves; conspicuous yellow fls. and prickly capsules. Fls. and fr. most of the year.

A native of tropical America, but established and met with along roadsides and as a weed in cultivated fields throughout India.

The yellow juice is used medicinally by natives as an application to indolent ulcers, and oil is expressed from the seeds which is used as an aperient.

CAPPARIDACEÆ.

17. **Gynandropsis pentaphylla,** *D.C.* F. B. I. i. 171; C. i. 40; Watt. iv. 190 Vern. *Hurhur* (Hin.—Ni.; Sau.); *Bera* (Kur.—Ni.).

An annual erect herb 2-4 ft. high. Leaves alt. 3-5 foliolate; leaflets elliptic-obovate, pubescent, crenate. Fls. white in a term. bracteate raceme. Stamens purple inserted half way up the gynophore. Fr. a viscid capsule 2-3 in. long.

Fls. *July-Sep.*; fr. *Aug.-Oct.*

Annual appearing in the rains and dying down in the cold season.

A very common weed of waste places. Chin.; Sau.; Ni. and no doubt in all Divisions.

The juice of the leaves is commonly used as a remedy for ear-ache. The leaves are eaten as a pot-herb. The seeds are used as a vermicide.

18. **Maerua arenaria,** *Hook f. & Thoms.* F. B. I. i. 171; Br. 31; G. 31; C. i. 41.

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A woody climber. Leaves, alt. elliptic, 1-3 in. long. Fls. greenish-white. The calyx tube is lined by a disk on the edge of which the petals are inserted. Fr. elongate many seeded, each seed portion forming almost a separate berry.

Fls. *Nov.-Feb.* ; fr. *Jan.-Apr.*

Usually found in hedges. Ni. (Punasa R.) ; Bet. ; southern low hills, Mel.

19. **Cadaba indica**, *Lamk.* F. B. I. i. 172 ; Br. 32 ; G. 33 ; C. i. 43 Vern. *Kali takal* (Mar.—Mel. ; Ak. ; Bul.).

A straggling much branched shrub. Leaves, alt. elliptic-oblong, 1-1½ in. Fls. yellowish-white in few-flowered terminal racemes. Stamens 4 inserted half way up the gynophore. Fr. cylindric, the seeds surrounded by an orange aril.

Fls. *Nov.-Mar.* ; fr. *Jan.-Apr.*

On old walls at Burhanpur, Ni. ; Mel. (Ellichpur) ; Ak. ; Bul. (Dadgaon, Purna R.).

20. **Crataeva religiosa**, *Forst.* F. B. I. i. 172 ; Br. 32 ; G. 32 ; C. 42 ; Watt. ii. 583. Vern. *Barna, paras pipal* (Sau.) ; *Karangi pipal* (Jub.) ; *Barmal* (Mel.) ; *Baran* (Chin.) ; *Banna* (Dam.).

A moderate sized tree. Leaves, alt. 3-foliolate, clustered towards the end of branches. Lateral leaflets oblique at the base. Fls. large, yellowish-white, on long pedicels. Stamens purple. Fr. a globose or ovoid berry 2-3 in. diam.

Fls. *Mar.-Apr.* with the new leaves ; fr. *June-July* ; leaves fall, *Jan.-Feb.* ; leaves renewed, *Mar.-Apr.*

Very scarce, wild. Ni. (Chandgarh R.) ; Bet. ; Mel. ; Sau. (Gharakota).

Cultivated in gardens and temple precincts, and as an avenue tree. Sau. ; Jub. ; Chin.

The leaves, bark and roots are used medicinally.

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21. **Capparis zeylanica,** *Linn.* F. B. I. i. 174; Br. 33; G. 33; C. i. 45; Watt. ii. 134. Vern. *Pachwa* (Mar.).

A scrambling glabrous shrub, armed with almost straight thorns. Leaves, alt. elliptic, nerves very prominent beneath. Fls. large, axillary, solitary, white with a basal blotch of yellow turning purple. Fr. a large ovoid scarlet berry.

Fls. *Feb.-Apr.*; fr. *June.*

Scarce. Gawalgarh, Mel.

The green fruit is eaten as a pickle.

22. **Capparis aphylla,** *Roth.* F. B. I. i. 174; Br. 33; G. 34; C. i. 46; Watt. ii. 130. Vern. *Karil* (Sau.; Jub.); *Ker* (Mar.).

A glabrous almost leafless shrub, branches numerous, green. Leaves very small, linear. Thorns yellowish straight. Fls. red, numerous, on short side branchlets. Fr. oblong, red.

Fls. *Nov-May*; fr. *Sep.-Dec.*

Scarce, Bul.; Sau. (Rehli); planted in hedges Jub.; Seo.

The flower buds are eaten as a pot-herb, and the fruit as a pickle.

23. **Capparis grandis,** *Linn.* F. B. I. i. 176; Br. 34; G. 35; C. i. 47; Watt. ii. 131. Vern. *Pachunda* (Mar.—Yeo.); *Pacharan* (Mel.; Bul.); *Pachar* (Ni.).

A small tree with corky bark, and long hanging branches. Leaves, alt. 2-3 in. elliptic-obovate, tomentose, secondary nerves 8-10 pr. very distinct. Fls. white, 1 in. diam., in terminal many-fld. corymbs. Fr. size of a nutmeg, purple.

Fls. *Feb.-Apr.*; fr. *Aug.-Oct.*

Fairly common in hedges and babul bans.

Ellichpur, Mel.; Yeo.; Ni. (Khandwa R.); Bul. (Bhongaon, Purna R.).

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24. **Capparis diversifolia,** *Wight & Arn.* F. B. I. i. 175; Br. 34.

A climbing shrub, nearly glabrous, recurved thorns, dark green branches, and ovate-lanceolate leaves. Fls. purple. Fr. ovoid, 1½ in. long.

This is included on the authority of Dickinson, but requires confirmation.

No locality given.

25. **Capparis sepiaria,** *Linn.* F. B. I. i. 177; Br. 34; G. 34; C. i. 48; Watt ii. 132. Vern. *Aundi* (Sau.).

A scrambling shrub, with recurved thorns. Leaves alt. oblong-elliptic, pubescent beneath. Fls. small, greenish-white, in terminal or axillary umbels. Fr. small globose, black when ripe.

Fls. *Feb.-Apr.*; fr. *June-July.*

Sau. (Dewal Res.); Mel. (Gugamal R.), but no doubt to be found in other Divisions, especially Berar Circle.

The plant possesses febrifugal properties.

26. **Capparis horrida,** *Linn.* F. B. I. i. 178; Br. 35; G. 36; C. i. 48; Watt ii. 131. Vern. *Waghoti* (Mar.—Berar; Chin.); *Nuspha* (Bet.); *Afua* (Ni.); *Afoh* (S. Man.); *Aundha* (Jub.); *Katnar, hartar* (Sau.); *Ulat kanta* (Gond.—Seo.).

A scrambling shrub with recurved thorns, and covered with rusty pubescence. Leaves, alt elliptic-oblong, shining. Fls. large, white to pink, placed one above the other in a vertical line over the leaf axils. Fr. globose, 1½ in. long, red-brown when ripe.

Fls. *Feb.-Apr.*, mainly on new leafless shoots. Fr. *June* onwards, ripening *Oct.* Evergreen, new shoots and leaves *Apr.* after flowering.

The leaves are used medicinally as a counter-irritant. In the Punjab and Sind the fruit is made into pickle.

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BIXACEÆ.

27. Cochlospermum Gossypium, *D. C.* F. B. I. i. 190; Br. 38; G. 37; C. i. 53; Watt ii. 412. Vern. *Gabdi, ganiar, galgal* (Hin.—N. C.; Ni.; Bet.); *Gongal, ganer* (Mar.—Berar); *Gejra* (Jub.); *Phangra* (Kur.—Mel.).

A small soft wooded tree with fluted bark. Leaves alt. palmately 5-lobed, grey-tomentose beneath. Fls. large, yellow, very conspicuous when the tree is leafless. Fr. a pear-shaped red-brown capsule 3-4 in. long.

Fls. *Feb.-Apr.*; fr. *Mar.-May*; leaves fall, *Dec.-Jan.*; leaves renewed, *June.*

On rocky hills and in dry localities, frequently associated with Salai. All Divisions, common.

The wood is quite useless either as timber or fuel. The soft silky cotton covering the seeds is sometimes used for stuffing pillows. A gum is obtained by tapping the tree, and is sold in bazaars as a substitute for 'katira.'

28. Bixa orellana, *Linn.* F. B. I. i. 190; Br. 39; G. 38; C. i. 53; Watt. i. 454. Vern. *Makhan* (Sau.).

A small evergreen tree, with alt. ovate, sub-cordate glabrous leaves. Fls. large 2 in. diam. white or pink in terminal panicles. Fr. a reddish-brown capsule clothed with soft prickles.

Fls. *Aug.-Sep.*

A native of America but cultivated and naturalised in India. In gardens, Sau.

Cultivated for the red dye obtainable from the pulp surrounding the seeds, which dye is in considerable demand

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Fls. *Nov.-Jan.*; fr. *Dec.-Feb.* Evergreen.

In rocky river beds, Jub.; Ni. (Nerbudda river); Mel.; Chin.; Sau. (Sonar nadi); Hosh.

Used for fuel in Bombay.

DIPTEROCAPEÆ.

34. **Shorea robusta,** *Gaertn.* F. B. I. i. 306; Br. 69; G. 77; Watt vi. pt. ii, 673. The Sal tree. Vern. *Sal* (Hin.); *Sarei, rinjal* (Gond.—Jub.; S. Man.; Hosh.; Chin.).

A large gregarious tree. Leaves, alt. broad-ovate, 4-10 in. long, glabrous and shining. Fls. small, yellowish, in axillary and terminal panicles. Fr. a 1-seeded nut closely embraced by the bases of the enlarged sepals, of which the 3 outer are 2-3 in. long.

Fls. *Mar.-Apr.*; fr. *June-July*; leaves fall, *Feb.-Mar.*; leaves renewed, *Mar.-Apr.* Seldom quite leafless, or only for a very short period.

Confined to sandstone formations in S. Man.; Jub. (Khitoli); Hosh. (Pachmarhi hills); Chin.

An extremely valuable timber, but a difficult wood to season. Used for sleepers, gun-carriages (Jub. Gun-carriage Factory), beams, doors, planking. When tapped it exudes a white aromatic resin, known as 'ral' (S. Man.), which is collected and used for incense, caulking boats and medicinally. The bark is used for tanning.

MALVACEÆ.

35. **Sida spinosa,** *Linn.* F. B. I. i 323; C. i. 92; Watt. vi. pt. ii, 686. Vern. *Mamas* (Sau.).

A small branched undershrub, with alt. elliptic, crenate, obtuse, somewhat pubescent leaves, with 1-3 spiny tubercles below them. Fls. white, solitary, axillary. Fr. of 3-5 pubescent, awned, carpels.

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Fls. *Aug.-Sep.* ; fr. *Sep.-Oct.*

On waste land. Jub.; Sau.; Bet.; Hosh.; Ni.

The leaves and root are used medicinally.

36. **Sida acuta,** *Burm.* F. B. I. i. 323; C. i. 93; Watt. vi. pt. ii, 679.

A much branched small undershrub. Leaves alt. lanceolate, with rounded base, sharply serrate, glabrous. Fls. 1-2 axillary, yellow. Peduncles jointed about the middle, shorter than the petioles. Fr. of 5 carpels, not pubescent, awned.

Fls. *Aug.-Oct.* ; fr. *Sep.-Nov.*

On waste ground; common. Jub.; Sau.; Mel.

A good fibre is obtained from the stems. The root is used as a febrifuge.

37. **Sida rhombifolia,** *Linn.* F. B. I. i. 323; C. i. 93; Watt. vi. pt. ii, 682. Vern. *Bariari* (Ni).

A small undershrub, with narrowly or broadly rhomboid serrate leaves, tomentose beneath. Fls. yellow axillary, and crowded towards the ends of the branches. Peduncles mostly twice as long as the petioles. Carpels 9-10, awned.

Fls. *Sep.-Dec.* ; fr. *Oct.-Jan.*

A common weed on waste land. Jub.; Sau.; Mel.; Ni.

The plant yields a good fibre, but there are several varieties of the plant, some yielding better fibre than others.

38. **Sida cordifolia,** *Linn.* F. B. I. i. 324; C. i. 94; Watt. vi. pt. ii, 680. Vern. *Mamas* (Sau.).

An erect undershrub, 2-4 ft. tomentose all over. Leaves alt. ovate, 1-2 in. long, crenate, cordate base. Fls. yellow, axillary. Peduncles as long as or a little shorter than the petioles. Carpels 7-10 with long awns.

Fls. *Aug.-Dec.* ; fr. *Oct.-Jan.*

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Common on waste land in the rains and cold weather. Sau.; Mel.; Chin. (Ambara K.).

The plant yields a fine white fibre.

39. **Urena lobata,** *Linn.* F. B. I. i. 329; C. i. 100; Watt. vi. pt. iv, 212.

A herbaceous undershrub, 2-4 ft. high, with alt. slig tly lobed, serrate, stellately hairy leaves. Main nerves 5-7, prominent beneath, with 1-3 glands on the under surface. Fls. pink, clustered. Fr. of 5 carpels covered with hooked bristles.

Fls. and fr. *Aug.-Dec.*

Common undershrub of waste places. Jub.; Hosh. (Pachmarhi); Sau. (Bahadurpur Res.; Jhilla).

Var. scabriuscula, D.C., with scarcely lobed leaves is found in Mel. and Pachmarhi, Hosh.

40. **Urena sinuata,** *Linn.* F. B. I. i. 329; C. i. 100; Watt. vi. pt. iv, 213.

Similar to preceding, but the leaves are divided below the middle into 5 or more oblong lobes. Fls. rose coloured, larger than preceding.

Fls. *Nov.-Dec.*

In waste places. Jub.

41. **Abutilon polyandrum,** *W. & A.* F. B. I. i. 325; C. i. 95; Watt. i. 17. Vern. *Chota bansa* (Hosh.).

An erect undershrub. Leaves, alt. ovate-cordate, long acuminate, up to 9 by 7 in. Fls. orange-yellow in long terminal racemes. Carpels 5, mucronate.

Fls. *Nov.-Jan.*

Hosh. (Pachmarhi hills).

42. **Abutilon indicum,** *G. Don.* F. B. I. i. 326.; C. i. 96; Watt. i. 16 Vern. *Tipari* (Sau.; Seo.; Ni.); *Kakai* (Sau.).

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An undershrub clothed with soft white hoary tomentum. Leaves alt. ovate-cordate, coarsely toothed, velvety on both surfaces. Fls. yellow, solitary, axillary, on long pedicels jointed very near the top. Carpels 15-20 truncate, mucronate.

Fls. *Aug.-Dec.*; fr. *Sep.-Jan.*

Common along roadsides and near villages. Sau.; Seo.; Ni. (Khandwa).

43. **Abutilon muticum,** *G. Don.* F. B. I. i. 327; C. i. 97; Watt. i. 17. Vern. *Kakai* (Sau.).

Pubescent undershrub. Leaves alt. as broad as long, cordate, dentate, velvety beneath, somewhat roughly tomentose above. Fls. orange, 2 in. across, axillary and running into term. panicles. Pedicels stout jointed near the fl. Carpels about 25 truncate, not beaked.

Fls. and fr. *Aug.-Dec.*

Along roadsides and near villages. Sau.

44. **Abutilon graveolens,** *W. & A.* F. B. I. i. 327; C. i. 97; Watt. i. 16.

Similar to preceding but clothed with long spreading scattered hairs, and sticky shorter hairs. Fls. orange with a darker centre.

Fls. and fr. *Oct.-Jan.*

Mel. (Gugamal R.).

45. **Hibiscus hirtus,** *Linn.* F. B. I. i. 335; C. i. 106. Vern. *Madanmast* (Sau.).

A hairy undershrub with herbaceous branches. Leaves alt. ovate, irregularly toothed. Fls. pink or white, axillary, with 6-9 short filiform involucral bracts. Fr. a globose capsule.

Fls. and fr. *Aug.-Nov.*

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A common weed along roadsides and on waste land in the rains. Jub.; Sau.; Bet. and probably in other Divisions

46. **Hibiscus micranthus,** *Linn.* F. B. I. i. 335; C. i. 107; Vern. *Chirethi* (Sau.).

Shrubby, with numerous slender, erect, branches. Leaves, 1-2 in. long, alt., ovate, serrate, scabrid and hairy. Fls. pink, solitary, axillary. Pedicels jointed about the middle. Involucral bracts 6, filiform. Capsule $\frac{1}{4}$ in. diam., globose. Seeds cottony.

Fls. and fr. *Oct.-Jan.*

In hedges, Ni; Mel. (Gugamal R.); Hosh. (Pachmarhi); Sau. (Rahatgarh).

47. **Hibiscus cannabinus,** *Linn.* F. B I. i. 339; C. i. 109; Watt. iv. 231. Vern. *Ambari* (Hin.). Deccan hemp.

A suffruticose herb with prickly stems. Leaves roundish, the upper deeply 3-5 lobed. Fls. yellow with purple centre. Calyx lobes glandular. Involucral bracts 7-10, free. Capsule ovoid, beaked, very hairy.

Fls. *Oct.-Dec.*; fr. *Nov.-Jan.*

Common in all Divisions.

Widely cultivated, usually between other crops, for its fibre.

48. **Hibiscus Sabdariffa,** *Linn.* F. B. I. i. 340; C. i. 110; Watt. iv. 243. The Rozelle. Vern. *Ambari* (Man.).

Shrubby, erect, glabrous, unarmed. Stem and branches reddish-purple. Leaves 3-5 lobed, the lobes serrate, glandular on the midrib beneath. Fls. purple with a darker centre. Involucral bracts 10 adnate to the calyx, both purple and accrescent in fruit. Capsule ovoid, beaked, hairy.

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Fls. and fr. *Oct.-Jan.*

S. Man. (Amarkantak).

Cultivated for its fibre. An acid jelly is made from the succulent calyces.

49. **Hibiscus ficulneus,** *Linn.* F. B. I. i. 340 ; C. i. 110 ; Watt. iv. 240. Vern. *Jangli bhendi* (Sau. ; Ni. ; Am.).

Herb, stems red, prickly. Leaves orbicular, deeply 3-5 lobed, coarsely crenate. Fls. white with mauve centre, in more or less leafless racemes. Involucral bracts 5-6, caducous. Capsule ovoid, covered with viscid hairs when green.

Fls. *Aug.-Oct.* ; fr. *Oct.-Dec.*

Common in hedges and along the edges of fields, Ni. ; Sau. ; Am. ; Mel. and probably elsewhere.

Said to yield an excellent fibre superior to that of *H. cannabinus*, but I have never found that it is made use of.

50. **Hibiscus tetraphyllus,** *Roxb.* F. B. I. i. 341 ; C. i. 111 ; Watt. iv. 246.

A large suffruticose hispid herb. Stems slightly prickly. Leaves cordate, scabrid with short hairs, coarsely dentate, deeply 5-7 lobed, the lobes sometimes again lobed. Fls. yellow with purple centre, axillary and clustered at the ends of the branches. Involucral bracts 4, quite separate. Capsule ovoid, hispid.

Fls. *Sep.-Oct.* ; fr. *Nov.*

Sau. (Rehli) ; Mel. and probably in other Divisions.

Said to yield a tough fibre.

51. **Hibiscus Abelmoschus,** *Linn.* F. B. I. i. 342 ; C. i. 112. ; Watt. iv. 229. The Musk mallow. Vern. *Jangli bhendi* (Ni.).

A tall herb, clothed with long hairs. Leaves more or less cordate, the lower ovate, the upper 3-7 lobed, the lobes coarsely toothed. Fls. 3 in. across, yellow

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with purple centre. Involucral bracts 8-12, caducous. Capsule fulvous hairy, oblong-lanceolate.

Fls. and fr. *Oct.-Jan.*

Chandni Range, Ni.

The stems yield an excellent fibre. The seeds are employed medicinally in N. India.

52. **Hibiscus esculentus,** *Linn.* F. B. I. i. 343; C. i. 112; Watt. iv. 237. Lady's fingers (fruit). Vern. *Bhendi* (Hin.—N. C.; B. C.).

Stems hairy, erect, not prickly. Leaves cordate, 3-5 lobed, coarsely toothed, scabrous. Fls. yellow with purple centre. Involucral bracts 8-10, shorter than calyx. Capsule pyramidal-oblong, frequently curved.

Fls. and fr. depend on the season of sowing.

Cultivated everywhere for the sake of the fr. which is used as a vegetable.

The plant is probably of African origin, though naturalised in India.

53. **Hibiscus cancellatus**, *Roxb.* F. B. I. i. 342; Vern. *Kamraj* (N. C.); *Kacheli* (Yeo.).

A very hairy or bristly herb, with cordate 5-angled leaves. Large yellow fls. with purple centre in term. racemes. Involucral bracts 10-15, filiform, very hairy. Capsule ovoid, strongly 5-ribbed, clothed with stiff hairs.

Fls. *Aug.-Oct.*; fr. *Oct.-Dec.*

Fairly common during the rains. Sau.; Dam.; Jub.; Hosh.; S. Man.; Seo.; Yeo. (Pusad R.).

A decoction of the plant is used in conjunction with other medicines for debility and impotence.

54. **Thespesia Lampas,** *Dalz.* F. B. I. i. 345; Br. 76; C. i. 114; Watt. vi. pt. iv, 45. Vern. *Jangli bhendi* (Hin.); *Mundi, nadanban* (Sau.); *Bankapas* (Jub.; Hosh.; Chin.); *Chichindur* (Mariampur, Mel.).

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A stout undershrub 4-6 ft. high. Leaves alt. cordate, 3-lobed, tomentose beneath. Large yellow fls. with crimson centre. Peduncles axillary, 3-fld. Capsule ovoid, pointed, usually 5-valved.

Fls. *Aug.-Oct.*; fr. *Nov.-Jan.* Perennial and deciduous, or dying down to the root and shooting out again in June.

Common as undergrowth in the denser forests, in all Divisions.

The young twigs yield a good fibre, used for binding loads of wood, etc. The root and fruit are said to be used medicinally in Chota Nagpur.

55. **Thespesia populnea,** *Correa.* F. B. I. i. 345; Br. 75; C. i. 114; G. 88; Watt. vi. pt. iv, 45. The Portia or Tulip tree.

A small evergreen tree. Leaves alt. ovate, cordate, acuminate, glabrous. Petioles 2-4 in. long. Fls. yellow with purple centre, axillary. Capsule globose.

Fls. *Oct.-Jan.*

Planted as a roadside tree, Rehli, Sau.

The wood is durable and is used in S. India for carts, boats, carriages and furniture. The bark yields a strong fibre, but is rarely employed. The leaves, applied hot, are used for poultices for sores and abscesses.

56. **Gossypium herbaceum,** *Linn.* F. B. I. i. 346; C. i. 116; Watt. iv. 25. The Cotton plant. Vern. *Kapas.*

The Cotton plant is too well known to require description, but it may be interesting to distinguish between two common varieties.

Var. I—Wightianum. Hinganghat cotton.

Involucral bracts shortly toothed. Corolla pale yellow with purple base.

Var. II—Hirsutum. Bracts deeply laciniate. Corolla pale yellow, without purple base.

The staple crop of Berar and Ni.

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57. **Kydia calycina,** *Roxb.* F. B. I. i. 348; Br. 78.; G. 89; C. i. 94. Vern. *Barga, baranga* (Hin.—N.C.); *Bhoti* (Mel.; Bul.); *Arang* (Kur.—Bairat. Mel.); *Safed dhaman* (Ni.; Am.)

A small tree, with alt. palmately 5-7 nerved, cordate, 3-7 slightly lobed leaves, tomentose beneath. Fls. white or pink in many fld panicles. Fr. a capsule size of a pea, from the base of which spread the brown persistent bracts, remaining long on the tree.

Fls. *Aug.-Oct.*; fr. ripens *Nov.-Jan.* and remains on the tree for months; leaves fall, *Feb.*; leaves renewed, *Apr.-May.*

Common in all Divisions in valleys and on hill slopes.

The bark yields a strong coarse fibre. The wood is of little value.

58. **Bombax malabaricum,** *D. C.* F. B. I. i. 349; Br. 77; G. 90; C. i. 120; Watt. i. 487. The Cotton tree. Vern. *Semal, semur* (Hin.—N. C.; Ni.; Bet.); *Khatsawar, khatsaweri* (Mar.—Yeo.; Am.); *Saori* (Kur.—Mel.; Seo.); *Bargu* (Gond.—Jub.).

A tall straight tree, the trunk and branches covered with hard sharp conical prickles. Leaves alt. 5-7 digitate; leaflets lanceolate glabrous.

Fls. large, conspicuous, waxy looking, red, appearing when the tree is leafless. Fr. a brown, ovoid, pendent capsule lined with white silky hairs.

Fls. *Feb.-Mar.*; fr. *Mar.-Apr.*; leaves fall, *Dec.*; leaves renewed, *June.*

Common in all Divisions, preferably on sandy alluvial soil.

The wood is very light and not durable except under water. It is used for dug outs, packing cases, toys, scabbards, and the lining of wells. The cotton from the capsules is used for filling beds and cushions.

A gum called 'Mocharas' is collected from the tree in Kumaon and sold for medicine.

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The undermentioned non-indigenous species is commonly cultivated :—

59. **Hibiscus Rosa-sinensis**, *Linn.* F. B. I. i. 344 ; Br. 75 ; G. 87 ; C. i 113 ; Watt iv. 242.

A shrub with ovate-lanceolate, irregularly serrate, glabrous leaves and large red fls.

Fls. at different seasons.

Common in gardens throughout the area. A native of China.

STERCULIACEÆ.

60. **Sterculia urens**, *Roxb.* F. B. I. i. 355 ; Br. 80 ; G. 94 ; C. i. 123; Watt vi. pt. iii, 364. Vern. *Kulu, karai* (Hin.—N. C.); *Kurlu* (S. Man.) ; *Karlu* (Jub. ; Seo.) ; *Kulu, karai, guru* (Mar.—B. C.); *Kurru* (Yeo.); *Guru* (Chin.); *Yiklai, taklej* (Kur.—Mel.); *Hitum* (Gond.—Seo.).

A large spreading tree, with smooth white or pink papery bark, and large, alt., shallowly palmately 5-lobed leaves, glabrous above, velvety below. Fls. yellow, small, numerous, in glandular pubescent panicles at the ends of the branches. Fr. of 4-5 ovoid follicles, red when ripe, covered with stiff stinging bristles.

Fls. *Dec.-Feb.* ; fr. *Mar.-Apr.* ; leaves fall, *Oct.* ; leaves renewed, *June*.

A characteristic tree of dry rocky hills, frequently allied with *Boswellia serrata*. Common in all Divisions.

The wood is of little value and seldom used. A gum called 'katila' which exudes from the trunk is collected and used. The seeds are roasted and eaten by Gonds and Kurkus. A fibre is obtained from the bark.

61. **Sterculia villosa**, *Roxb.* F. B. I. i. 355 ; Br. 80 ; G. 94 ; C. i. 124 ; Watt. vi. pt. iii, 365. Vern. *Udar* (Hin.—S Man.) ; *Butiudal* (Jub.) ; *Kuthada, kudal* (Mel. ; Ni.) ; *Khardo* (Bet.) ; *Kudar* (Gond.—Seo.).

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A middling sized tree with light grey warty bark. Leaves larger than preceding, deeply 5-7 lobed, the lobes often 3-partite. Fls. yellowish to pink, the panicles longer than in preceding, rusty-pubescent. Fr. similar to preceding, but rusty-villous.

Fls. *Jan.-Mar.*; fr. *May-June*; leaves fall, *Nov.*; leaves renewed, *June*.

Chiefly in valleys on sandy soil, but nowhere common. Jub.; S. Man.; Mel. (Gugamal R.); Bet.; Seo.; Ni. (Piplod R.).

A valuable tree on account of its fibre, which is made into ropes and coarse bags. In the Duars the wood is used for tea boxes. A gum exudes from cuts in the bark.

62. **Sterculia colorata,** *Roxb.* F. B. I. i. 359; Br. 84; G. 96; C. i. 125; Watt. vi. pt. iii, 361. Vern. *Pinj, chaura* (B. C.).

A large tree with spreading branches and ash coloured bark. Leaves crowded at the ends of the branches shallowly 3 or 5-lobed with deeply cordate base. Fls. very conspicuous, brilliant coral-red in short term. panicles, before the leaves appear. Follicles 1-5 membranous, opening long before maturity, boat-shaped, bearing 1 or 2 seeds.

Fls. *Mar.-Apr.*; fr. *June-July*; leaves fall, *Nov.*; leaves renewed, *Apr.*

On slopes and in valleys. Scarce. Mel.; Ak.

A thick white fibre is obtained from the bark and is used for rope making. In Berar it is used for decorating bullock's horns during the Pola festival.

63. **Helicteres Isora,** *Linn.* F. B. I. i. 365; Br. 88; G. 99; C. i. 128; Watt. iv. 212. Vern. *Marorphal* (Hin.—N. C.); *Marorseng* (Yeo.); *Muradsheng* (Mar.—B. C.); *Aithi, aitha* (Jub.; Ni.; Bet.; Seo.; S. Man.); *Aithni* (Sau.; Dam.; Chin.); *Korajbothi* (Kur.—Mel.).

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A large tomentose shrub. Leaves alt. oblique, usually cordate, orbicular, irregularly toothed, and 5-7 basal nerves. Fls. zygomorphic brick-red or lead-colour, in axillary fascicles. Fr. very characteristic consisting of 5 brown carpels twisted together in the form of a screw 2½ in. long.

Fls. *July-Dec.*; fr. *Oct.-Mar.*; leaves fall, *Feb.-Mar.*; leaves renewed, *Apr.-May*.

Common in all Divisions as undergrowth in hilly jungles, especially on rocky slopes.

A strong fibre used for coarse rope is obtained from the bark. The fruits are used medicinally for colic and intestinal complaints.

64. **Pterospermum acerifolium,** *Willd.* F. B. I. i. 368; Br. 91; G. 100; C. i. 129; Watt. vi. pt. i, 362. Vern. *Machkund*.

A tall evergreen tree with smooth ash-coloured bark, and large palmately-nerved, orbicular, cordate-based, sinuately lobed leaves, white tomentose beneath. Fls. fragrant, white, axillary. Fr. a brown tomentose pentagonal capsule remaining long on the tree.

Fls. *Mar.-Apr.*

Planted in avenues and near villages. Jub.; Sau.

The wood is occasionally used for planking in Bengal.

65. **Eriolæna Hookeriana,** *W. & A.* F. B. I. i. 370; Br. 87; G. 103; C. i. 131; Watt. iii. 265. Vern. *Bhoti* (Hin.—N. C.; Ni.); *Bhondia-dhaman* (Mar.—B. C.); *Arang* (B. C.); *Bondri* (Ni.).

A shrub or small tree. Leaves alt. as broad as long, cordate, coarsely toothed, with 7-9 basal nerves, white tomentose beneath. Fls. large, yellow with multisect involucral bracts. Fr. a woody 10-valved capsule.

Fls. *July-Sep.*; fr. *Nov.-Jan.*; leaves fall, *Feb.-Mar.*; leaves renewed, *June*.

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Fairly common in all Divisions, generally on good deep soil.

The wood is strong and used for axe handles. A fairly strong fibre is obtained from the bark.

66. **Melhania Hamiltoniana,** *Wall., var.* arbutilioides, *Arn.* F. B. I. i. 372; G. 104. Vern. *Piyabansa* (Sau.).

A small tomentose shrub. Leaves alt. ovate-acuminate, serrate, cordate 5-nerved base, pubescent on both surfaces, white beneath. Fls. orange-yellow with 3 broad involucral bracts. Peduncles axillary 3-fld. Fr. a villous capsule surrounded by the dried up fl.

Fls. *Aug.-Oct.*; fr. *Nov.-Jan.*

On dry rocky soil. Sau. (Rahatgarh); Yeo. (Darwha R.).

67. **Waltheria indica,** *Linn.* F. B. I. i. 374; C. i. 135.

An erect pubescent undershrub, woody at the base. Leaves alt., ovate to oblong, 1-2½ in. long, serrate, at distant intervals along the erect stems. Fls. very small, yellow, in axillary heads. Fr. a very small capsule, enclosed in the calyx.

Fls. *Nov.-Dec.*

On plateaux and in open dry forest with long grass. Ni. (Chandgarh Res.); Jub.; Sau. and probably in other Divisions.

TILIACEÆ.

For the grouping of this very difficult genus I have had the benefit of Mr. R. S. Hole's advice and have examined the very large collection of specimens brought together at Dehra Dun. I have followed Mr. Hole's arrangement.

68. **Grewia Rothii,** *DC.* F. B. I. i. 385. Vern. *Ghatyari* (Sau.; Jub.; Dam.); *Bansilli* (Gond.—S. Man.); *Kursi,*

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barsala (Jub.); *Gengerua* (Berar; Hosh; Ni.); *Kharola* (Bet.); *Atariya* (Yeo.).

A virgate shrub, 3-6 ft. with hoary branchlets. Leaves, alt., ovate-lanceolate, 3-5 in. long, serrulate, acute, conspicuously white hoary tomentose beneath. Basal nerves 3-5, the 2 nearest the midrib reaching more than ¾ way up the leaf. Peduncles ax. slender, 3-4 times the length of the petiole, with 2-3 yellow fls. on slender pedicels. Fr. globose, faintly lobed, ¼ in. across, hoary, purple.

Fls. *June-Aug.*; fr. *Aug.-Oct.*; leaves fall, *Feb.-Mar.*; the shoots frequently die down to the ground; leaves renewed, *May-June*.

Common as undergrowth in forests in all Divisions. Very common in Sal forest; also in open areas.

This species was described in my Berar List as G. salvifolia. *Heyne*.

69. **Grewia orbiculata,** *Rottler*. (Syn. G. rotundifolia, *Juss.*) F. B. I. i. 386; C. i. 141; G. 109.

A small tree with pubescent branches. Leaves variable ovate, broadly elliptic, orbicular, or rotund, often unequal based, irregularly serrate. Most characteristic is the hoary pubescence on both surfaces, giving a grey-green colour beneath, 3-5 nerved. Fls. yellow, very numerous, tomentose, on slender peduncles which are usually twice as long as the petioles. Fl. buds woolly, ellipsoid. Fr. distinctly 2-lobed.

Fls. *Apr.-May*; fr. *July-Aug.*

This has only been found so far in Mel. and Ni. In the Mel. it is found in the extreme western blocks; Dhulghat; Bairat, 3,700 ft. Here it takes the form with ovate unequal-based leaves, while in Ni (Punasa Res.) the form has almost rotund or orbicular leaves.

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70. Grewia tiliæfolia, *Vahl.* F. B. I. i. 386, Br. 98; G. 109; C i. 141; Watt. iv. 183. Vern. *Dhaman* (Hin., Mar.—N. C.; B. C); *Baringa* (Kur.—Mel., tomentose form).

A middle sized tree with smooth grey bark. Leaves broadly ovate, 3-5 in. long, crenate-dentate, usually very oblique, base sometimes cordate, glabrous on both sides when mature. Stipules large, falcate, auricled. Fls. yellow in ax. umbels of 3 fls. Peduncles considerably shorter than petiole. Fl. buds nearly globose. Fr. black, size of a pea, or 2-lobed.

Fls. *May.-July*; fr. *July-Sep.*; leaves shed *Mar.-Apr.*; leaves renewed, *Apr.-May*.

Common throughout the area in all classes of forest. The above description is typical but the species is very variable and undoubtedly hybridizes with other Grewias leading to many intermediate forms. The young shoots appearing in the hot weather are frequently quite tomentose but become glabrous as they mature.

A tomentose form with the underside persistently white tomentose is commonly found in the Mel. and Hosh.

Hybrids between G. Rotbii, *D.C.*, and G. tiliæfolia, *Vahl.*, with leaves approaching to G. Rothii but not white beneath have been found in the Gorjhamar and Ranipura Res., Sau.

The wood is tough and elastic and highly valued for shafts, axe handles, shoulder poles, etc., but trees of suitable dimensions for shafts are not very common in this area. The bark yields a fibre used elsewhere for cordage.

71. Grewia asiatica, *Linn.* F. B. I. i 386; Br. 98; C. i. 142; G. 111; Watt. iv. 177. Vern. *Phalsa.*

A small tree. Leaves broadly ovate to sub-orbicular, acute, coarsely toothed, base rounded, or slightly oblique, rough above, hoary tomentose beneath. Sti-

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pules linear. Fls. similar to preceding, but peduncle longer than petiole. Fr. red, globose, 1-2 lobed.

This species is only known under cultivation. It is extensively cultivated in Sind and Gujarat for the fruit from which sherbet is made.

In this area it has been found in Ni. and Jub.

The bark yields a good fibre used elsewhere for rope-making. The fr. is eaten.

72. Somewhere intermediate between G. asiatica, *Linn.*, and G. tiliæfolia, *Vahl.*, is a form which may be called **G. subinequalis,** *D.C.* It is a small tree with stellately hairy young parts. The leaves are ovate to orbicular, with usually cordate base, less coarsely toothed than G. asiatica, and densely pubescent below. Peduncle about equal in length to the petiole. Buds ovoid.

This is found in Hosh. (Pachmarhi and Bori Res.); also Dhulghat, Mel ; S. Man.

73. **Grewia elastica,** *Royle.* (Syn. Grewia vestita, *Wall.*; Grewia celtidifolia, *Juss -vide* Haine's List of S. C. in *Indian Forester*, Feb. 1913.) F. B. I. i. 387 ; Watt. iv. 178. Vern. *Khursi* (S. Man.).

A small tree, young parts tomentose. Leaves ovate or elliptic, acuminate, finely serrate, base oblique or rounded, white tomentose beneath. Stipules linear. Fls. yellow. Peduncles rather stout, tomentose, about as long as or a little longer than petiole. Buds oblong. Fr. globose, size of a pea, hairy.

Fls. *Apr.-June* ; fr. *June-Aug.*

Apparently confined to hilly localities. S. Man. (Shahpura R.); Hosh. (Bori Res. ; Dhupgarh, Pachmarhi, 4,200 ft.).

This species varies considerably and exhibits a series of forms which may be grouped into two main forms,

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G. elastica, *Royle*, and G. vestita, *Wall*. The form from S. Man. seems more to approach G. elastica. Some of the specimens have leaves green beneath and non-tomentose. The form G. vestita from Pachmarhi has more broadly ovate leaves, less oblique, and the peduncles are mostly longer than the petiole. The form G. elastica with white tomentose leaves is also common at Pachmarhi.

The wood is tough and elastic and is used elsewhere for bows, spear handles and shingles.

74. Grewia sapida, *Roxb.* F. B I. i. 387; Br. 98; G. 108. Vern. *Khursi* (S. Man.).

An undershrub with annual shoots from a woody root-stock. Leaves broadly oblong or obovate, obtuse, with 5-nerved cuneate base, green or hoary beneath. Petioles very short. Peduncles long up to $1\frac{1}{4}$ in. Fl. buds oblong. Fr. size of a pea, faintly lobed.

Fls. *Apr.-June*; fr. *May-July*.

Common in grass lands in S. Man. coming up annually after the fires have passed over the ground.

75. Grewia flavescens, *Juss.* (Syn. G. pilosa, *Lam.—vide* Berar List.) F. B. I. i. 388; Br. 97; G. 111; C. i. 142. Vern. *Ghordhaman* (Berar); *Gursakri* (Ni.; S. Man.).

A very straggling shrub with sharply 4-angled or 4-lobed stems and divaricate branchlets. Herbaceous portions clothed with stellate hairs. Leaves lanceolate-oblong, 2-4 in. long, serrate Fls. yellow on short peduncles about equal to the petioles. Buds large, oblong, constricted in the middle. Fr. 2-4 lobed, crustaceous, clothed with short stellate hairs. Fls. *July-Sep.*; fr. ripens *Aug.-Oct.* but remains long on the tree; leaves renewed, *June*.

Common throughout the B. C.; S. Man. and probably elsewhere in N. C.

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76. **Grewia abutifolia,** *Juss.* F. B. I. i. 390; Br. 99; C. 108; C. i. 144. Vern. *Dhaman* (Sau.; Hosh.; Ni.); *Sitagathalu* (Kur.—Mel.); *Gadargumra* (Sau.).

A shrub, 6-8 ft. high, branchlets, leaves and inflorescence stellately hairy. Leaves broadly ovate, usually more or less 3-5 lobed towards the apex, irregularly serrate. Fls. yellow, ax. clustered. Peduncles very short less than half the length of petiole. Fr. slightly 2-4 lobed, with a crustaceous brown rind, edible

Fls. *June-July;* fr. *Sep.-Oct.*, but remains very long on the branches, often up to the next flowering season. Almost evergreen.

Not uncommon in hedges in open country. Sau.; Hosh.; Ni.; Mel. and probably elsewhere. Specimens from Ni. and Mel. were wrongly named G. scabrophylla, *Roxb.*, in my Berar List. This latter is a N. India species.

77. **Grewia hirsuta,** *Vahl.* F. B. I. i. 391; Br. 100; C. i. 144 Vern. *Gengerua* (Sau.; Hosh.); *Kharota* (Bet.); *Kareta* (Hosh.); *Gursakri* (Jub.; Chin.; Seo.).

A small shrub 2-4 ft. high, all parts softly tomentose. Leaves lanceolate acuminate, serrulate, base 3 nerved. Petioles very short. Fls. white, subsequently yellow. Peduncles longer than petioles, 2-4 fld. Fr. size of a small cherry, red with a crustaceous rind, sparingly clothed with long stiff hairs.

Fls. *July-Sep.;* fr. *Nov.-Jan.;* leaves fall, *Feb.-Mar.;* leaves renewed, *Apr.-May.*

Common as undergrowth in all classes of forest.

Sau.; Jub.; Hosh.; S. Man.; Chin.; Seo.; Ni.; Bet.; Yeo.; Ak.; Mel. and probably in all Divisions.

78. **Triumfetta pilosa,** *Roth.* F. B. I. i. 394; C. i. 147; Watt. vi. pt. iv, 202. Vern. *Barijaljatang* (Mel.).

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A shrub 3-6 ft., with red bulbous hairs on the stem. Leaves alt. ovate-lanceolate, serrate, sub-cordate, 5-nerved, stellately hairy on both sides. Fls. small yellow in fascicled axillary cymes. Fr. conspicuous, being a globose capsule clothed with hooked spines, $\frac{1}{3}$-$\frac{1}{2}$ in. long.

Fls. *Sep. Nov.*; fr. *Nov.-Feb.* Branches die down in H. S.

In shady forest. Mel. (Gugamal R.); Hosh. (Pachmarhi hills).

79. **Triumfetta rhomboidea,** *Jacq.* F. B. I. i. 395; C. i. 147; Watt. vi pt. iv, 202. Vern. *Chirpat* (Sau.).

A small undershrub or herb with pubescent branches, and usually 3-lobed, irregularly serrate, 5-nerved, stellately hairy leaves. Fls. small yellow in dense term. cymes. Fr. small ovoid with minute hooked spines.

Fls. *Aug.-Dec.*; fr. *Sep.-Jan.* The branches frequently die down in the H. S.

A common undershrub of waste places, field boundaries, and open forest. Jub.; Sau.; Ni.; Mel. and doubtless in all Divisions.

Yields a soft fibre said to be used in Madras.

Used medicinally as a demulcent.

80. **Triumfetta rotundifolia,** *Lam.* F. B. I. i. 395; C. i. 148.

A small undershrub with orbicular, irregularly toothed, 3-5 nerved leaves, white tomentose beneath. Fls. small, yellow, in interrupted terminal racemes. Fr. small ovoid, echinate.

Fls. *Aug.-Dec.*; fr. *Sep.-Jan.* The branches usually die down in the H. S.

Found in similar situations to the preceding, and on rocky ground. Jub.; Sau.; Ni.

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81. **Corchorus capsularis,** *Linn.* F. B. I. i. 397; C. i. 148; Watt. ii. 535. Vern. *Chinch* (Hin.—Sau.; Seo.).

Annual glabrous herb. Leaves lanceolate, serrate, the lowest serrature on each side prolonged into a filiform appendage. Small yellow fls. Fr. a subglobose muricate capsule.

Fls. and fr. *Sep.-Oct.*

On waste land, Sau. (Dhamoni); Seo.

The well known jute fibre is obtained from this plant in Bengal.

82. **Corchorus olitorius,** *Linn.* F. B. P. i. 397; C. i. 149; Watt. ii, 540. Vern. *Chinch* (Hin.—Seo.; Sau.); *Chooich* (Berar); *Rajan* (Ni).

Tall, much branched annual. Leaves somewhat broader than preceding. Fls. yellow. Fr. a cylindrical 10-ribbed capsule.

Fls. and fr. *Sep.-Oct.*

A common weed of cultivation and in moist places in all Divisions.

Jute fibre is also obtained from this plant. The leaves are frequently eaten as a vegetable.

83. **Corchorus trilocularis,** *Linn.* F. B. P. i. 397; C. i. 149; Watt. ii. 544. Vern. *Chinch* (Sau.).

Annual; stem and branches more or less hairy. Leaves lanceolate to elliptic-oblong. Fls. as in preceding. Capsule 2-3 in. long, scabrous, 3-4 angled.

Fls. and fr. *Nov.-Jan.*

A common weed of waste land. Sau.; Bet., Ni.; Jub.

The leaves are eaten as a vegetable. The seeds are used medicinally in Bombay for fever.

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MALPHIGIACEÆ.

84. **Hiptage Madablota,** *Gaertn.* F. B. I. i. 418; Br. 108; G. 118; C. i. 157; Watt. iv. 253. Vern. *Kampthi* (Hin.—Jub.).

A large climbing shrub with opp. elliptic shining leaves 4-7 in. long. Fls. in ax. racemes, fragrant, white; petals fringed, the 5th dashed with yellow. A large conspicuous gland between two of the sepals on the outside. Fr. of 1-3 carpels, each carpel with 3 wings, a large central wing 1½ in. long between 2 lateral wings ¾ in. long. Sometimes there is a small 4th wing.

Fls. *Feb.-Apr., Oct.* (Mel.); fr. *Apr.-June.* Evergreen.

Along the banks of rivers and in damp places. Jub.; Sau. (Jujharghat; Behrol); Am.; Mel.; Chin. (Umreth R.); Hosh. (Roarighat).

The leaves are said to be used in cutaneous diseases, and the juice as an insecticide.

85. **Aspidopterys cordata,** *Juss.* F. B.I. i. 421; Br. 110; C. i. 158. Vern. *Kutkivel* (Yeo.).

A slender tomentose climber with large opp. orbicular, cordate, acuminate leaves, white tomentose beneath. Fls. white, in lax pendulous axillary panicles. Fr. of 3-winged samaras, the wings nearly orbicular 1 in. long.

Fls. *Aug.-Oct.*; fr. *Nov.-Dec.*

In ravines and along nalas. Mel.; Yeo. (Ganganmal Res.); Chin. (Umreth R.).

ZYGOPHYLLACEÆ.

86. **Tribulus terrestris,** *Linn.* F. B. I. i. 423; C. i. 160; Watt. vi. pt. iv, 78. Vern. *Gokru* (Hin.—B.C.; Sau.; Chin.); *Sarata* (Mar.—Ak.).

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A procumbent silky-villous herb, with opp. pinnate leaves, one of each pair smaller than the other. Fls. ax. solitary, yellow. Fr. of 5 woody cocci each with 2 pr. of hard spines.

Fls. and fr. almost throughout the year.

A common weed in dry parts throughout the B. C.; also Sau.; Chin.

The fruit is used medicinally throughout India as a tonic and aphrodisiac, while the young leaves and stems are eaten as a pot-herb especially in times of scarcity.

RUTACEÆ.

87. **Murraya exotica,** *Linn.* F. B. I. i. 502; Br. 113; G. 125; C. i. 182; Watt. v. 288. Vern. *Rakatbera* (Gond.—Hosh.).

A small evergreen tree, with smooth yellowish-white bark. Leaves pinnate; leaflets 5-7, alt. dark green, shining, 1-3 in. long. Fls. white, fragrant, in short ax. and term. corymbs. Fr. a small red berry pointed at both ends.

Fls. *Apr.-July*; fr. *Dec.-Feb.* Evergreen.

In ravines usually at high elevations, but not common. Hosh. (Bori R., Pachmarhi); Seo.; Mel.; Berar. Frequently grown in gardens, Jub.

The fragrant bark is used as a cosmetic in Burma.

88. **Murraya Koenigii,** *Spreng.* F. B. I. i. 503; Br. 113; G. 126; C. i. 182; Watt. v. 288. Vern. *Karinim, gornim* (B. C.); *Karipat* (Jub.); *Karinim* (Sau.; Chin.); *Mitnim* (Bet.; Seo.).

A small tree with a close shady crown, all parts with a strong peculiar smell. Leaves alt. imparipinnate, 1 ft. long, with 10-25 leaflets, dark green above, pale beneath. Fls. white, in term. corymbose panicles. Fr. a small ovoid, black berry.

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Fls. *Feb.-Apr.* ; fr. [*July-Aug.* Evergreen, or nearly so.

Reported from all Divisions B. C., but whether truly wild or not seems doubtful.

Met with in gardens and as an escape, Jub. Occasionally planted, Am. ; Chin. Once found in hedge, Rehli R., Sau. apparently wild, but possibly an escape only.

The leaves, bark and root are used in native medicine as a tonic and stomachic.

89. **Limonia acidissima,** *Linn.* F. B. I. i. 507 ; Br. 118 ; G. 127 ; C. i. 185 ; Watt. iv. 641. Vern. *Bilsena* (Jub. ; Sau. ; Dam.).

A small spinous tree. Leaves alt. imparipinnate, with winged rhacis ; leaflets 5-7, crenate. Fls. white, fragrant, in short ax. racemes. Fr. a small black globose berry.

Fls. *May-June* ; fr. *Nov.-Dec.* ; sub-deciduous at time of flowering.

Apparently not very common. Sau. (Baleh Res., Kuarpur) ; Jub. ; Dam.

The fr. is very acid ; it is exported from the Malabar coast to Arabia where it is used as a condiment in cooking and also medicinally as a tonic.

90. **Citrus medica,** *Linn.* F. B. I. i. 514 : Br. 123 ; G. 130 ; C. i. 189 ; Watt. ii. 349. Sweet and acid Lime. Vern. *Nimbu.*

A spinous shrub or small tree. Young shoots purple. Leaves 1-foliolate, petioles naked or winged. Fls. white to pink, in short ax. racemes. Fr. globose, usually yellow when ripe.

Fls. and fr. at almost all seasons. Evergreen. Apparently wild Pachmarhi hills, Hosh. (Br.) ; Sau. (Damoni Res.), wild, or escape. Doubtfully wild,

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Chin.; Seo. Largely cultivated all over India. The cultivated forms include (1) the Citron, (2) the Lemon, (3) the Sour Lime, (4) the Sweet Lime.

The fr. of the wild species is pickled and eaten in some parts of India.

91. **Feronia Elephantum,** *Correa.* F. B. I. i. 516; Br. 119; G. 131; C. i. 191; Watt. iii. 324. The Wood-apple. Vern. *Kawat, kauth, kavit* (Mar.—B. C.; Chin.); *Kabit* (Mel.; Seo.); *Kaitha* (Hin.—Ni.; Bet.; Sau.; Jub.; Dam.; Seo.); *Katbel* (Hin.—Jub.).

A large thorny tree, with dark green, alt. imparipinnate leaves and opp. small entire leaflets. Fls. greenish-red, in short lateral or term. panicles. Fr. globose, 2-3 in. diam. with a grey, rough, woody rind.

Fls. *Feb.-Apr.* (Br.), *June* (Sau.); fr. ripens and falls following *Nov.-Feb.*; never quite leafless; leaves renewed, *Apr.-May.*

In all Divisions. Very often cultivated near villages especially in Sau.; Dam.; Jub.

The acid pulp of the fruit is made into jelly. The tree is not felled in this area. The wood which is strong and durable is said to be used in the Bombay Presidency for various purposes.

92. **Aegle Marmelos,** *Correa.* F. B. I. i. 516; Br. 119; G. 131; C. i. 192; Watt. i. 117. The Bael tree. Vern. *Bel* (Hin.—N. C.; B. C.); *Mahaka* (Gond.—Seo.).

A small thorny tree. Leaves alt. 3-foliolate. Fls. greenish-white, fragrant, in short lateral panicles. Fr. globose or ovoid 2-3 in. diam.; rind smooth, hard, yellow when ripe.

Fls. *May-July*; fr. ripens *May-June* the following year; leaves fall, *Mar.*; leaves renewed, *May-June.*

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In all Divisions, chiefly on rocky soil and in valleys. Frequently cultivated, but more commonly wild than the preceding species.

The wood is used for pestles of oil and sugar mills, and agricultural implements, but the tree is chiefly valued for its fruit which is a well known remedy for dysentery.

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93. **Citrus Aurantium.** *Linn.* The Orange is extensively cultivated, especially at Nagpur.

94. **Citrus decumana,** *Nurr.* The Pumelo, cultivated in gardens.

95. **Clausena Wampi,** *Oliver,* is often cultivated in gardens. Its fruit is about as large as a marble and is used for tarts and preserves.

SIMARUBACEÆ.

96. **Balanites Roxburghii,** *Planch.* F. B. I. i. 522; Br. 124; G. 135; C. i. 195; Watt. i. 363. Vern. *Hinguan, hingota* (Hin.—N. C.; Ni.; Bet); *Hingan* (Mar.—B. C.).

A shrub or small tree with yellowish bark and sharp straight thorns. Leaves alt., pinnate, with 1 pr. of small coriaceous leaflets. Fls. small, greenish-white, fragrant, in lateral fascicles. Fr. a yellowish ovoid drupe 2 in. long.

Fls. *Apr.-May;* fr. ripens *Nov.;* evergreen; leaves renewed, *Apr.*

Common, chiefly in the trap area, and on black cotton soil in open country. Not found in S. Man. (Kenny).

The wood is used for fuel and elsewhere for walking sticks. An oil is expressed from the seeds. The seeds, bark and leaves are used in native medicine, and are purgative.

97. **Ailanthus excelsa,** *Roxb.* F. B. I. i. 518; Br. 125; G. 132; C. i. 193; Watt. i. 148. Vern. *Maharukh*

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(Hin., Mar.—B. C.); *Mahanim* (N. C.); *Aral* (Ni.); *Marukha* (Mel.).

A large tree with grey bark, and large alt. pinnate leaves with 10-13 pr. of very coarsely toothed unequal sided tomentose leaflets; the leaves crowded at the end of the branches. Small white fls. in lax panicles. Winged fruit linear oblong, reddish-brown.

Fls. *Jan.-Mar.*; fr. *Apr.-May*; leaves fall, *Dec.-Jan.* (Br.); leaves renewed, *Mar.-Apr.* (Br.).

All Divisions, chiefly on deserted village sites inside forest, and round inhabited villages.

Wood, white, soft and of little use. The leaves and bark are in great repute as a tonic in Bombay.

98. **Ailanthus malabarica,** *D.C.* F. B. I. i. 518; Br. 127; G. 133; C. i. 194. Vern. *Goralim* (Mel.). A large tree. Differs from preceding in the fewer leaflets, 8-10 pr. which are glabrous and not toothed. The winged fruit is longer than that of preceding.

Fls. *Feb.-Mar.*; fr. *May*.

Apparently wild at Bairat, 3,900 ft., Mel.—(Donald).

The wood is not used. The tree yields a resin which is used medicinally, especially in dysentery.

OCHNACEÆ.

99. **Ochna pumila,** *Ham.* F. B. I. i. 524; Br. 128; G. 135; C. i. 196.

A low undershrub with a perennial root-stock throwing up annually a number of short sub-herbaceous stems with alt. oblanceolate finely serrate leaves 3-6 in. long. Fls. bright yellow, 1½ in. across, in bracteate umbels on peduncles 2-3 in. long. Fr. of 3-10 rugose, ellipsoid drupes, ⅓-½ in. long, seated on an enlarged disk.

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Fls. *Apr.-June* ; stems appear *Apr.* after the forest fires.

Motinala Res., S. Man. (Benskin).

BURSERACEÆ.

100. **Boswellia serrata,** *Roxb.* F. B. I. i. 528 ; Br. 129 ; G. 137 ; C. i. 198 ; Watt. i. 515. Vern. *Salai, saleh* (Hin., Mar.—N.C. ; B. C.).

A tree with greenish-grey bark peeling off in thin flakes. Leaves alt. imparipinnate, with opp. crenate serrate leaflets. Fls. small white, in ax racemes. Fr. trigonous, ½ in. long.

Fls. *Feb.-Apr.* ; fr. *Apr.-May* ; leaves fall, *Dec.-Jan.* ; leaves renewed, *June.*

All Divisions. Very common on dry rocky hills of the trap area, associated with *Sterculia urens, Odina Wodier,* and *Cochlospermum Gossypium.* Constitutes nearly 50 % of the forests of the Ni. Divn. Associated with Teak it acts as a valuable nurse for that species when young.

The heart-wood is dark brown and fairly durable. In Ni. it is only used for fuel, but in Berar it is used for doors of native houses. There is a considerable export of Salai planks from the Mel. for this purpose, and it is also made into charcoal. In the N.C. it is very little used.

A resin is obtained from cuts in the bark which has medicinal properties. More recently the wood has become of importance as being suitable for the match industry.

101. **Garuga pinnata,** *Roxb.* F. B. I. i. 528 ; Br. 131 ; G. 138 ; C. i. 199 ; Watt. iii. 483. Vern. *Kenkar, kakar* (Hin.—N C. ; Ni. ; Bet.) ; *Bania kakar* (Sau.) ; *Ghogar* (Hin.—Jub.) ; *Gurgu* (Gond.—Jub. ; Seo.) ; *Gharri* (Baiga—S. Man.) ; *Kekda, kahud* (B.C.) ; *Kekad* (Chin.).

A moderate sized tree, with alt., imparipinnate leaves which turn crimson before falling and are crowded

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near the ends of branches. Leaflets 6-9 pr. opp., crenate, pubescent. Fls. yellow, in erect panicles from the ends of the leafless branches. Fr. black, fleshy, size of a gooseberry, edible.

Fls. *Feb.-Apr.*; fr. *June-July*; leaves turn deep red before falling in *Dec.-Jan.*; leaves renewed, *June*.

In all Divisions, in hilly localities, on slopes and in ravines. An associate of Sal.

Reproduces readily from seed and cuttings, and coppices well. It has a reddish-brown heart-wood of good quality quite fit for furniture, but as a rule the tree is found comparatively small with little or no heart-wood, and then the wood is of poor quality, not durable and little used. The fr. is eaten raw and pickled, and the leaves are used for fodder.

102. **Balsamodendron Mukul**, *Hook.* F. B. I. i. 529; Br. 133; G. 139; C. i. 200; Watt. i 366. Vern. *Gugal*.

A much branched woody shrub. Bark like that of young Salai; lateral branchlets ending in spines. Leaves 1-3 foliolate, leaflets obovate, small, smooth and shining. Fls. small brownish-red in fascicles of 2 or 3. Fr. red, ovoid, ⅓ in. diam.

Fls. *Feb.-Mar.*; fr. *Apr.-May*; leaves fall, *Nov.-Dec.*; leaves renewed, *Apr.*

On dry rocky soil in arid regions. Mel.; Ni.; Bet. Apparently cultivated as a hedge, Rahatgarh, Sau.

An important shrub on account of its growth in localities where other and better species do not thrive. The wood is not used.

A gum resin known as Gugal is extensively collected in Sind and used medicinally, especially in leprosy and rheumatism.

MELIACEÆ.

103. **Melia Azedarach**, *Linn.* F. B. I. i. 544; Br. 140; G. 144; C. i. 205; Watt. v. 221. The Persian lilac. Bead tree. Vern. *Bakain* (Hin.—N.C.; B.C.).

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A tree, with alt. bi-pinnate leaves ; 3-4 pr. of pinnæ, and 3-11 ovate serrate leaflets. Fls. fragrant, lilac, in ax. panicles. Fr. yellow, nearly globose.

Fls. *Apr.-June* ; fr. *Nov.-Dec.* ; leaves fall, *Dec* ; leaves renewed, *May*.

Planted as a roadside tree in all Divisions, particularly in frost localities, on account of its resisting qualities.

The leaves, bark, and fruit have medicinal properties. The stone of the fr. is used all over India as a bead for necklaces and rosaries.

104. **Azadirachta indica**, *A. Juss.* (Syn. Melia Azadirachta, Linn.). F. B. I. i. 544 ; Br. 139 ; G. 143 ; C. i. 207 ; Watt. v. 211. The Neem tree. Vern. *Nim* (Hin.—N. C. ; B. C.) ; *Limbosi* (Mel.).

A large tree, with alt. imparipinnate leaves, and 5-9 pr. unequal-sided serrate leaflets. Fls. white, scented, in axillary panicles. Fr. a yellow drupe, about the size of an olive.

Fls. *Mar.-May* ; fr. *June-July* : evergreen ; leaves fall and renewed, *Feb.-Mar.*

Nowhere truly wild, but common on and near deserted village sites inside forests, where it is practically naturalised. Extensively planted as a roadside tree in all Divisions. Rare (S. Man.).

The wood is durable and is used for construction of carts, agricultural implements, and in S. India for furniture. The bark is bitter and is used as a febrifuge ; the leaves are made into a poultice for ulcers ; the fr. is used medicinally, and the seeds to kill insects and for washing the hair.

105. **Soymida febrifuga**, *A. Juss.* F. B. I. i. 567; Br. 144; G. 155; C. i. 215; Watt. vi. pt. iii, 318. Vern. *Rohan, rohni* (Hin.—N. C.) ; *Rohan, rohani* (B. C. ; S. Man.); *Ragat rohoda* (Am.) ; *Soimi* (Gond.—Jub.).

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A moderate sized tree, with alt. paripinnate leaves, 9-18 in. long, and 3-6 pr. opp. leaflets. Fls. greenish-white in large term. panicles. Fr. pear-shaped, woody, 2 in. long.

Fls. *Mar.-May*; fr. *May-June*; leaves fall, *Feb.-Mar.*; leaves renewed, *Apr-May*.

Common in mixed deciduous forest in all Divisions.

A valuable tree on account of the dark red-brown heart-wood, which is very hard and durable. It is used for construction, well-work, ploughshares, and oil-mills. Its value as an ornamental furniture wood is not sufficiently appreciated. The bark is bitter and is used medicinally; it also yields a red fibre used in Chota Nagpur for making ropes.

106. **Cedrela Toona**, *Roxb.* F. B. I. i. 568; Br. 145; G. 157; C. i. 217; Watt. ii, 233. The *Toon* tree or Red Cedar. Vern. *Tun* (Hin.); *Mahalim* (S. Man.); *Mahalun* (Jub.); *Goria nim* (Mel.).

A large tree, 50-60 ft., almost evergreen. Leaves alt. paripinnate; leaflets 5-10 pr. unequal sided, ovate-lanceolate. Fls. white, scented, in large drooping term. panicles. Fr. an oblong capsule 1 in. long.

Fls. *Mar.-Apr.*; fr. *May-June*; leaves fall, *Dec.-Feb.*; leaves renewed, *Feb.-Apr.*

Scarce. On the higher plateaux, S. Man.; Hosh. (Pachmarhi hills); Mel.

Occasionally planted as a roadside tree, Jub.; Sau.

A very valuable timber tree, with a durable reddish-brown heart-wood extensively used for furniture in N.-W. India. In S. India it is used for cigar-boxes. The bark is astringent and gives a resinous gum; the leaves are used for cattle fodder.

107. **Chloroxylon Swietenia**, *D.C.* F. B. I. i. 569; Br. 146; G. 160; C. i. 218; Watt. ii. 270. Satin wood. Vern. *Bhirra* (Hin., Mar.—N. C.; B. C.); *Ghiriya* (N. C.; Bet.; Ni.); *Haladbera* (Yeo.).

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A small tree with thick corky bark. Leaves alt. paripinnate, with 10-20 pr. gland-dotted unequal-sided leaflets. Fls. white, in term. and ax. panicles. Capsule oblong, $1\frac{1}{2}$ in. long.

Fls. *Mar.-Apr.*; fr. *May-June*; leaves fall, *Jan.-Feb.*; leaves renewed, *May*.

In all Divisions but local, preferring the dry sandstone formations, with shallow soil. Lower slopes of the Mel.; Ni., near the Nerbudda river in gregarious patches; Sau. (Deori and Rehli R. on sandstone); S. Man., in south-west only; Yeo. (Pusad R.).

The wood is yellow, hard and with a beautiful satin lustre. It is much sought after for building, for carts and agricultural implements. Also for cabinet work, backs of brushes and picture frames. There is a considerable trade in the timber from the south-west of Dam.

OLACACEÆ.

108. **Olax scandens,** *Roxb.* F. B. I. i. 575; Br. 147; G. 163; C. i. 221.; Watt. v. 479. Vern. *Harduli* (Mar.—Ni.; Jub.; Chin.); *Adhanipari* (Jub.); *Bara nikada* (Yeo.).

A large climbing shrub, with a few stout thorns on the old branches. Leaves alt. ovate-oblong, obtuse, 2-3 in. long. Fls. small, white, fragrant, in short ax. racemes. Fr. a yellow drupe enclosed, except the top, in the enlarged calyx.

Fls *Apr.-June*; fr. *Nov. Jan.*

Along rivers, in damp places and ravines. S. Man.; Jub.; Chin, (Amarwara R.); Yeo.; Ni.; Seo.

The fr. is said to be employed in Hazaribagh for making sherbet.

CELASTRACEÆ.

109. **Celastrus paniculata,** *Willd.* F. B. I. i. 617; Br. 162; G. 175; C. i. 231; Watt. ii. 237. Vern. *Kakundan* (Hosh.; Sau.; Jub.; Dam.); *Malkangni*

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(Hin.—B. C.; Chin.; Seo.); *Warangul* (S. Man.); *Warangar* (Gond.—Jub.; Seo.); *Pingvel* (Mel.).

A large climbing shrub with long lenticellate branches, alt., obovate, serrulate leaves, green fls. $\frac{1}{8}$ in. diam. in term. drooping panicles, and yellow 3-lobed capsules, the seed enclosed in a red aril. The yellow capsules remain on the shrub for some time after the seeds have fallen.

Fls. *Apr.-June*; fr. *Oct.-Dec.*; leaves fall, *Mar.-Apr.*; leaves renewed, *Apr.-June*.

Common throughout the area.

In Madras an oil known as Oleum nigrum is extracted from the seeds by distillation and is used medicinally. Locally, yellow oil is extracted by compression; it is used in cases of gout and paralysis.

110. **Gymnosporia montana,** *Benth.* (Syn. Celastrus senegalensis, Lamk.) F. B. I. i. 621; Br. 163; G. 177; C. i. 233; Watt. ii. 239. Vern. *Bharati*, *yekal* (Mar.—B. C.); *Baikal* (Chin.; Sau.; Jub.; Dam.; Ni.; Seo.); *Mekar* (Mel.); *Bharati* (Mar.—Chin.).

A tall shrub, branchlets reddish when young, usually ending in thorns. Leaves coriaceous, obovate, narrowed into the petioles. Fls. small, greenish-white, in ax. cymes. Capsule size of a pea, reddish-purple when ripe.

Fls. *Oct.-Nov.*; fr. *Jan.-Feb.*; practically evergreen, only partially leafless in *Apr.*

Common in the drier forests on poor soil, especially in the trap area. Not found in S. Man.—(Kenny).

111. **Elæodendron glaucum,** *Pers.* F. B. I. i. 623; Br. 164; G. 178; C. i. 233; Watt. iii. 207. *Vern. Jamrassi* (Hin.—N. C.; B. C.); *Bhutekassi* (B. C.); *Aran* (Mar.—Yeo.); *Mimri* (S. Man.); *Niru* (Kur.—Mel.).

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A small tree, with blackish bark, exfoliating in four-sided small scales. Leaves opp. glabrous, elliptic, crenate, 3-5 in. long. Fls. small, numerous, in lateral divaricate cymes. Drupe, ovoid, ½ in. long, yellowish-green when ripe.

Fls. *Oct.-Dec.*; fr. *Jan.-Mar.*; leaves fall, *Mar.-Apr.*; leaves renewed, *June*.

Common throughout the area, especially on trap.

The wood is flesh coloured and useful for cabinet work, picture frames, and combs. In this area it is mainly used for fuel.

RHAMNACEÆ.

112. **Ventilago madraspatana,** *Gaertn.* With this may be considered *V. calyculata*, *Tul.*, which is probably only a variety. F. B. I. 631; Br. 167; G. 180; C. i. 238; Watt. vi. pt. iv, 226, 227. Vern. *Keoti* (Hin.—N. C.; Ni.; Mel.); *Lokhandi* (Jub.; Seo.); *Sakalvel* (Mar.—Yeo.); *Kharbel* (Mel.; Am.); *Dharsankar* (Yeo.).

A powerful climber, with green, ribbed branches, and alt. ovate, entire or toothed leaves. Fls. numerous, small, greenish, with a rather unpleasant smell, in large interrupted term. panicles. Fr. a nut girt round the middle by the adnate calyx tube, and prolonged into a linear-oblong wing.

Fls. *Nov.-Jan.*; fr. *Feb.-Apr.*; evergreen. The form V. calyculata seems to be the general one in this area.

Common chiefly along the banks of streams throughout the area.

The bark yields a good rope fibre, and the root-bark gives a valuable chocolate or red dye which is made use of in S. India.

113. **Zizyphus jujuba,** *Lam.* F. B. I. i. 632; Br. 169; G. 181; C. i. 240; Watt. vi. pt. iv, 367.

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Vern. *Ber, bor* (Hin., Mar.—N. C.; B. C.); *Renga* (Gond.—Seo.).

A large shrub or small tree, armed with stipular spines. Leaves alt. ovate-oblong, entire or serrulate, glabrous above, white or buff tomentose beneath. Small green fls. in dense ax. clusters. Fr. a fleshy drupe, globose, orange or red when ripe.

Fls. *Apr.-July*; fr. *Dec.-Feb*; leaves fall, *Mar.-Apr.*; leaves renewed, *May-June*. (Brandis and Haines give *Mar.-Apr.* for the new foliage, but more often than not I have found it leafless until well into *June*.)

Common throughout the area on and near old village sites, and wherever there are signs of old cultivation. Very frequent on black cotton soil. Possibly originally introduced and since run wild.

It is extensively cultivated for its fruit, the wild and the cultivated forms being locally (Jub., Sau., Dam.,) distinguished, *viz*:—

(1) Dakera ber, the wild form, with globose fruit which ripens *Dec.-Jan.*

(2) Sarra ber, the cultivated form, with oblong fruit which ripens *Feb.-Mar.*

The wood is used for saddle-trees, agricultural implements, carts, oil-mills, etc., and gives a good fuel.

114. **Zizyphus Œnoplia**, *Mill.* F. B. I. i. 634; Br. 170; G. 183; C. i. 242; Watt. vi. pt. iv, 371. Vern. *Makor, makoya* (Hin.—N. C.; B. C.); *Irun* (Yeo.; Am.); *Iruni* (Mar.—Chin.; Seo.).

A thorny scrambling shrub, developing into a strong climber. Leaves alt. distichous, oblique, 3-4 basal nerves, brown tomentose beneath. Fls. in short ax. cymes. Fr. a small black, shining berry.

Fls. *July-Sep*; fr. *Nov.-Dec.*; leaves fall, *Feb.-Mar.*; leaves renewed, *May-June*.

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Common throughout the area, but especially on the Vindhyan sandstones. In some parts of Sau. it is a serious pest overgrowing and smothering every other species. A characteristic species of heavily overgrazed forest.

Used for fencing for fields. The fr. is eaten. Goats are very fond of the leaves.

115. **Zizyphus rotundifolia,** *Lamk.* (Syn. Z. nummularia, *W. et A.*) F. B. I. i. 633; Br. 170; G. 182; C. i. 241; Watt. vi. pt. iv, 370. Vern. *Jharia ber* (Hin.—Jub.; Sau.; Hosh.; S. Man.; Seo.; Chin.); *Ranbor* (Jub.; Chin.); *Bor* (Bul.; Am.; Mel.; Ni.; Bet.); *Dongar renga* (Gond.—Seo.).

A small much branched shrub with zigzag branches and slender thorns. Leaves orbicular, ½-1 in. long, grey tomentose beneath. Fls. in ax. sessile cymes. Fr. ⅓ in. diam., globose, red when ripe.

Fls. *Oct.-Dec.* (*Mar.-June* according to Brandis); fr. *Nov.-Jan.*

On open waste land, and black cotton soil. Forms straggling clumps in hedges and near villages. It is frequently confused with Z. jujuba. In all Divisions.

It is used for the fences of fields. The fruit is eaten, and the leaves are used as fodder for sheep and goats, being especially valued in the Punjab and Sind for this purpose.

116. **Zizyphus xylopyra,** *Willd.* F. B. I. i. 634; Br. 171; G. 183; C. i. 242; Watt. vi, pt. iv, 374. Vern. *Ghont* (Hin.—Dam.; Sau.; Hosh.; Jub.; Chin.; Seo.); *Ghattol* (Gond.—Chin; S. Man.; Bet.); *Ghoti* Mar.—Chin.; Am.); *Ghota* (Mel.); *Ghatbor* (B. C.).

A straggling shrub or small tree with or without thorns. Leaves broad ovate, 1½-3 in. long, oblique, glabrous above, tomentose beneath. Fls. green in ax. peduncled cymes. Fr. globose, greyish-green, woody, 1 in. diam.

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Fls. *Apr.-June;* fr. ripens *Dec.-Jan.,;* leaves fall, *Feb.-Mar.;* leaves renewed, *Apr.-May.*

Common throughout the area, and often gregarious in dry stony localities.

The wood is hard and durable, and where large enough is used for construction and agricultural implements. In this area it is one of the principal trees for the production of lac, especially in Dam., Sau., Jub.

The fruit is used for tanning purposes.

117. **Zizyphus rugosa**, *Lamk.* F. B. I. i. 636; Br. 171; G. 184; C. i. 243; Watt. vi. pt. iv, 372. Vern. *Churna* (Hin.—Hosh.; Sau.); *Churni* (Mel.; Bet.; Chin.; Seo.); *Sakria* (Bairat, Mel.); *Sura* (S. Man.); *Sagra* (Jub.).

A straggling shrub, often climbing. Branchlets and underside of leaves densely clothed with ferrugineous tomentum. Large elliptic serrulate leaves, 3-6 in. long. Fls. greenish-yellow in large panicles on leafless branches. Fr. globose, white, fleshy, edible.

Fls. *Feb.-Apr.;* fr. *May-July;* evergreen—(Haines). Leaves shed *Apr.*—(Hole).

Apparently confined to the more hilly portions of the area. S. Man.; Hosh. (Pachmarhi hills); Mel. (Gugamal R.); Bet.; Jub.; Chin.; Sau. (Gundrai Res.; Jujharghat).

The fr. is eaten by natives.

118. **Rhamnus Wightii**, *W. et A.* F. B. P. i. 639; Br. 172; G. 186; C. i. 244; Watt. vi. pt. i, 442.

A large shrub. Leaves alt. narrowly-elliptic acuminate, finely serrate, 3-4 in. long. Fls. yellowish-green ♂ in ax. racemes, ♀ in. ax. fascicles. Fr. a small obovoid 3-lobed berry.

Fls. *July-Sep.;* fr. *Nov.-Jan.*

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Rare. Confined to the higher elevations. S. Man. (Amarkantak); Hosh. (Pachmarhi).

The bark is highly esteemed in the W. Peninsula for its tonic properties.

119. **Helinus lanceolatus**, *Brandis*. F. B. I. i. 644; Br. 175; G. 189.

A green slender climber, the branchlets ending in circinnate tendrils. Leaves alt. ovate or lanceolate, entire, 2-3 in. long. Fls. small, yellow, in slender peduncled cymes. Fr. a 3-celled coriaceous drupe ¼ in. diam.

Fls. *Jan.-Apr.*; fr. *Apr.-May*.

On the higher ghats and plateaux. Not very general. Jub.; Hosh. (Roarighat, Pachmarhi); Mel. (Gugamal R.); Sau. (Hatkoh Res.).

VITACEÆ (AMPELIDEÆ).

120. **Vitis quadrangularis**, *Wall*. F. B. I. i. 645; Br. 177; G. 189; C. i. 250; Watt. vi. pt. iv, 256. Vern. *Harjuri* (Sau.; Chin.).

A perennial climber. Stem and branches, green, fleshy, quadrangular, the angles winged, sometimes nearly leafless. Leaves alt. fleshy, glabrous, ovate or 3-7 lobed, 1-2 in. long. Fls. 4-merous in shortly peduncled cymes. Fr. a red berry.

Fls. *July-Aug.*; fr *Oct.-Nov.*; the new shoots appear in *July* with the fls.

Berar—(Dickinson's list, no locality). This should be fairly common in the drier Divisions. Cultivated in gardens, Sau.; Chin.

The stems are applied by natives to assist the healing of broken bones. The young stems are eaten in curries.

121. **Vitis repanda**, *W. and A.* F.B.I. i. 648; Br. 176; G. 190; C. i. 251. Vern. *Dokarbel* (Sau.; Ni.); *Jujil* (Mel.); *Panibel* (Chin.).

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A large climber with soft stem and corky bark. Leaves alt. large, cordate, broadly ovate, with repand margins, densely tomentose beneath when young. Fls. 4-merous, in peduncled leaf-opposed tomentose, branched cymes. Fr. a pyriform berry.

Fls. *May-June* on the new shoots; the leaves turn yellow in *Dec.* and fall in *Jan.*; leaves renewed, *May*.

This species has been previously overlooked by me, having been confused with *V. latifolia*, Roxb. It is probably common throughout the area. Mel.—(Donald); Pachmarhi hills, Hosh.—(Haines); Ni.; Sau. (Jallandhar Res.); Chin.

The stem yields drinkable water when cut in two places.

122. **Vitis Linnæi,** *Wall.* F. B. I. i. 649; Br. 176; C. i. 252; Watt vi. pt. iv, 255. Vern. *Dokarela, jugbel* (Ni.).

A scandent shrub or climber clothed with grey or fulvous pubescence; variable ovate or 3-5 lobed, coarsely toothed, densely tomentose leaves, and 4-merous minute fls. in pedunculate cymes. Berry blue with a glaucous bloom.

Fls. *Aug.-Sep.*; fr. *Oct.-Nov.*; dies down in the cold weather appearing again in the rains.

Common in hedges, Ni., Mel., Chin., and probably in other Divisions.

123. **Vitis latifolia,** *Roxb.* F. B. I. i. 652; Br. 177; G. 190; C. i. 253; Watt. vi. pt. iv, 255. Vern. *Popasvel, randrakshi, nardel, kandvel* (Berar); *dokarbel* (Hin.—Jub.; S. Man.; Seo.; Chin.; Hosh.; Ni.); *Doto* (Gond.—Jub.; Seo.); *Imlora* (Sau.; Chin.).

An extensive scarcely woody glabrous climber. Leaves alt., as broad as long, 3-7 lobed, irregularly toothed, 4-7 in. long. Fls. 5-merous, reddish-brown, in compact cymes, the peduncle bearing a forked tendril below the cyme. Berry globose, black, edible.

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Fls. *July-Aug.*; fr. *Sep.-Nov.*; dies down in the hot weather.

Very common in hedges, and in forest, throughout the area.

A decoction of the root is mixed with lime to increase its cohesiveness for building purposes.

124. **Vitis carnosa**, *Wall.* (Syn. V. trifolia, *Linn.*) F. B. I. i. 654; Br. 178; C. i. 254; Watt. vi. pt. iv, 252. Vern. *Dokarbel* (Sau.).

A perennial climber woody at the base, with 3-foliolate, petioled, pubescent leaves, crenate leaflets, and 4-merous greenish fls., in divaricate long-peduncled cymes. Berries black, depressed, globose.

Fls. *July-Aug.*; fr. ripens *Oct.-Dec.*; the annual shoots die down *Jan.-Feb.*, appearing again in *June*.

Common in hedges, Jub.; Sau.; Ni.; Mel.; Chin.; Berar—(Dickinson's list, no locality).

The roots and leaves are said to be applied as remedies to boils and tumours.

125. **Vitis setosa**, *Wall.* F. B. I. i. 654; C. i. 254; Watt. vi. pt. iv, 257.

A weak succulent climber, clothed with glandular bristly hairs; thick, fleshy, sessile, 3-foliolate leaves, and serrate-dentate leaflets. Fls. 4-merous, in leaf opposed, divaricate, glandular cymes. Berry ovoid, glandular-hispid, scarlet.

Fls. *July-Aug.*; fr. *Oct.-Dec.*; dies down in the cold weather.

Common in hedges, Ni.

The plant is said by Watt. to be very acrid; the leaves are applied to indolent tumours in the form of a poultice to hasten suppuration.

126. **Vitis auriculata**, *Roxb.* F. B. I. i. 658; C. i. 256; Watt. vi. pt. iv, 252. Vern. *Ambatvel* (Mar.—Chin.;

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Bul.; Ak.; Yeo.); *Kumbela* (Mel.); *Totam* (Ni.); *Khatua* (Sau.).

An extensive climber with corky bark. Young branches succulent. Leaves digitate, 5-foliolate, long petioled, with large ear-shaped stipules. Fls. 4-merous, in much branched divaricate cymes. Fr. the size of a cherry, shining, red.

Fls. *Aug.-Sep.*; fr. *Nov.-Dec.* The leaves turn yellow on the stem before falling in *Nov.-Dec.* Perennial, the succulent branches die down about *Jan.-Feb.*

Frequent in shady forest, less so in open cultivated areas. Jub.; Sau.; Chin.; Mel.; Ni. (Chandgarh R.); Bul.; Ak.; Yeo.

The young shoots and leaves are eaten as a vegetable. The plant appears to be confused by Watt. with V. carnosa so far as the vernacular name and properties are concerned.

127. **Vitis vinifera**, *Linn.* The Grape Vine. Vern. *Angur*. Occasionally cultivated. Burhanpur, Ni.; Mel.

128. **Leea macrophylla**, *Roxb.* F. B. I. i. 664; Br. 180; G. 191; C. i. 259; Watt. iv, 617. Vern. *Hathipan* (Sau.; Chin.; Hosh.); *Dupu* (Ni.); *Hathikand* (Kur.—Mel.; Ni.; Bet.).

A robust herb, 2-3 ft., from a perennial root-stock with few, huge, simple ovate-cordate leaves. Small white fls. in terminal much branched corymbose cymes. Fr. a black, usually 3-6 lobed berry.

Fls. *July-Sep.*; fr. *Oct.-Nov.*; leaves turn yellow about *Dec.* and plant dies down in *Jan.* reappearing in *June*. Fairly common, usually on black soil. Sau.; Hosh.; Chin.; Mel.; Am.; Bet.; Ni. and probably in other Divisions.

The root is used medicinally in the cure of guinea-worm.

129. **Leea aspera**, *Edgw.* F. B. I 665; Br. 180; G. 191; C. i. 260; Watt. iv. 616. Vern. *Kuram* (Hosh., Ni.); *Hansia dafar* (Sau.; Dam.; Chin.); *Chirpali* (Yeo.).

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A shrub, 3-6 ft. high, stems and branches furrowed, often herbaceous. Lower leaves 2-pinnate, upper simply pinnate. Leaflets elliptic with short stiff hairs above, toothed, the bifurcations of the main lateral nerves running into the teeth. Fls. white in much branched pubescent cymes. Berries size of a pea, black when ripe.

Fls. *July-Sep.*; fr. *Oct.-Dec.*; dies down completely about *Jan.*, reappearing in *June*.

Common in hedges, on waste land, and in forest, on good soil. Jub.; Sau.; Dam.; Hosh.; Chin.; Ni.; Mel.; Yeo. and probably in other Divisions.

The roots, leaves and fr. are eaten.

130. **Schleichera trijuga,** *Willd.* F. B. I. i. 681; Br. 189; G. 194; C. i. 266; Watt. vi. pt. ii, 487. Vern. *Kusam* (Hin.—N. C.); *Kusumb* (Mar.—B. C.); *Baru* (Kur.—Mel.).

A middle sized tree with smooth grey bark. Leaves alt., paripinnate, with 2-4 pr. of opp. entire leaflets 3-9 in. long, the lowest pr. smallest. Fls. small, yellow, in numerous lateral racemes. Fr. size of a small plum, coriaceous, pointed, usually echinate with blunt prickles.

Fls. *Mar.-Apr.*; fr. *June-Aug.*; leaves fall, *Jan.-Feb.*; leaves renewed, *Mar.*; the young foliage often at first deep red.

Common in all Divisions in the better class forests. Seldom in dry scrub jungle.

The wood is very strong and durable. The heart-wood which is red is used for naves of wheels, oil and sugar mills, agricultural implements, etc., where strength and hardness are required. The best quality of lac is produced on this tree.

The kernel of the fruit is eaten, and an oil is expressed from the seeds.

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SAPINDACEÆ.

131. **Dodonœa viscosa,** *Linn.* F. B. I. i. 697; Br. 186; G. 202; C. i. 269; Watt. iii. 172. Vern. *Lahan lokhandi* (Mar.—Berar); *Sanatha* (Berar); *Kharata* (Bet.); *Baru* (Mel.).

A light green shrub, up to 10 ft. high, the young shoots sticky with a bright yellow resin. Leaves sim., alt., lanceolate, shining, tapering into a short marginate petiole, 1-3 in. long. Fls. small, greenish-yellow, in short axillary panicles. Fr. a membranous capsule ⅙ in. long with 2-4 wings.

Fls. rains—(Brandis), *Nov.-Feb.*—(Haines), *Dec.-Jan.* (Sau.); fr. cold season—(Brandis), *Oct.-Nov.*—(Haines), *Jan.-Mar.* (Sau.; Hosh.). Evergreen.

A very local species, favouring the sandstone formations. So far only found in Hosh. (Pachmarhi hills); Bet.; Bul.; Mel.; Seo.

It is frequently grown in gardens, more especially as a hedge.

132. **Sapindus laurifolius,** *Vahl.* F. B. I. i. 682; Br. 191; G. 996; C. i. 266; Watt. vi. pt. ii, 468. The Soapnut. Vern. *Ritha* (Hin.—N. C.; B. C.).

A large tree, with alt. paripinnate leaves, and 2-3 pr. of opp. elliptic leaflets. Fls. white in term. rusty-pubescent panicles. Fr. fleshy, 2-3 lobed, clothed with fulvous hairs.

Fls. *Oct.-Dec.*; fr. *Feb.-Apr.*

Occasionally met with near villages, usually planted, Jub.; Sau.; Hosh.; Am. (rare); Bet.; Ni. (Chandni R.); Yeo.; Mel.; Chin.; Seo.

The fruit is very commonly used for washing as a substitute for soap; it is also used in native medicine.

133. **Cardiospermum Halicacabum,** *Linn.* F. B. I. i. 670; C. i. 263; Watt. ii. 155. The Heart-pea or

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Balloon-vine. Vern. *Kalagumchi*, *sirmola* (Sau.); *Popli* (Chichona, Mel.—[Donald]); *Wasan* (Mar.—Am.; Bul.; Mel.).

A slender annual and perennial climber. Leaves alt. 2-ternate, leaflets inciso-serrate. Fls. small, white, in few fld. long peduncled axillary umbels with 2 opp. coiled tendrils below the umbels. Fr. a 3-angled inflated capsule. Seeds globose, black, with a small white heart-shaped aril.

Fls. *Aug.-Nov.*; fr. *Oct.-Jan.*; dies down about *Mar.* appearing again in *June*.

Common in hedges. Jub.; Sau.; Chin.; Am.; Bul.; Ni.; Mel.; and no doubt in other Divisions.

The leaves are eaten in times of scarcity. The root is used in native medicine as an emetic and laxative. The whole plant is used in rheumatism and lumbago.

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134. **Nephelium Litchi**, *Lamb.* The Litchi introduced from S. China is occasionally cultivated in gardens on account of its fruit.

ANACARDIACEÆ.

135. **Rhus parviflora**, *Roxb.* F. B. I. ii. 9; Br. 196; G. 208; Watt. vi. pt. i, 498.

A large shrub or small tree, all parts clothed with dense brown tomentum. Leaves alt. 3-foliolate, the leaflets obovate, the upper portion irregularly crenate, terminal leaflet the largest, 2-3 in. long. Fls. small, greenish, in term. panicles. Fr. $\frac{1}{6}$ in. diam., ovoid, compressed, red-brown, shining.

Fls. *May-June*—(Brandis); fr. *Jan.-Feb.*
Rare. Hosh. (Pachmarhi hills).

The fr. is used medicinally in the Punjab as a substitute for tamarind.

136. **Mangifera indica**, *Linn.* F. B. I. ii. 13; Br. 206; G. 211; C. i. 273; Watt. v. 146. The Mango tree. Vern.

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Am (Hin.—N. C.; Ni.; Bet.); *Amba* (Mar.—Berar). *Marka* (Gond.—Seo.; Jub.).

A large spreading tree, up to $\frac{50}{7}$ with simple alt. coriaceous, oblong, shining leaves. Fls. small, yellow, with a disagreeable odour, in large many fld. panicles. Fr. 2-6 in. long, fleshy, yellow when ripe.

Fls. *Jan.-Mar.*; fr. *May-June*; evergreen, the new leaves often at first red-brown, in *Feb.-Mar.*

In all Divisions. So extensively cultivated, that it is difficult to determine where it is truly indigenous, but it is not infrequently found in deep ravines on hill slopes.

Mainly cultivated and planted on account of its fruit, and as an avenue tree and for camping grounds on account of the shade it gives. The wood is used for planking and construction, but it shrinks and warps considerably in seasoning.

137. **Buchanania latifolia**, *Roxb.* F. B. I. ii. 23; Br. 205; G. 216; C. i. 275; Watt. i, 544. Vern. *Achar, char* (Hin., Mar.—B. C.; N. C.); *Sareka* (Gond.—Seo.; Jub.); *Tarop* (Kur.—Mel.); *Chironji* (the fruit).

A small straight tree, with dark-grey rough bark, cut up into square bosses by deep narrow cracks. Leaves alt. oblong, coriaceous, villous beneath, 5-8 in. long. Fls. small, greenish-white, in term. pyramidal panicles. Fr. a small black drupe, edible.

Fls. *Jan.-Feb.*; fr. *Apr.-May*; nearly leafless for a short time during the dry season—(Brandis). In this area practically leafless, *Apr.-May*; leaves renewed, *June*.

Very common in all Divisions.

The wood is of poor quality and seldom used. The kernel of the fr. is an important article of minor produce; it is extensively used in native sweetmeats; the kernels are also pounded and baked into a sort of bread.

138. **Buchanania angustifolia**, *Roxb.* F. B. I. ii. 23; Br. 205; G. 217; C. i. 276. Vern. *Mota char* (Mar.).

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A middle sized tree, resembling the preceding, but the leaves are smaller, narrower and quite glabrous. The panicles of fls. are also smaller and ax. as well as terminal. Fr. obliquely globose.

Fls. *June-July;* fr. *Dec.-Jan.*

Scarce. Only reported from the Ajanta jungles, Bul., in Dickinson's list.

The wood is used for making spoons in Chanda—(Donald).

The kernel of the fruit is eaten and is said to be superior to that of B. latifolia.

139. **Odina Wodier,** *Roxb.* F. B. I. ii. 29; Br. 200; G. 218; C. i. 277; Watt. v. 445. Vern. *Mohi, moyen, mohin, mohni* (Hin., Mar.—B. C.; Chin.); *Mowai* (Jub.; Seo.; Am.); *Moyen* (Hin.—Chin.; Seo.; Jub.); *Jhingan* (Hin.—Jub.); *Gunja* (S. Man.; Jub.; Sau.; Dam.; Hosh.).

Usually a medium sized very spreading tree in this area, with a thick trunk. Bark ash coloured, smooth. Leaves alt., crowded near the ends of branches, imparipinnate. Leaflets 3-5 pr. ovate-oblong, acuminate, glabrous, 3-6 in. long. Fls. small, greenish, in pendent racemes at the ends of branches. Fr. a small reniform red drupe.

Fls. *Feb.-Apr.;* fr. *May-June;* leaves fall, *Nov.-Dec.;* leaves renewed, *June.*

Common in all Divisions.

The wood is little used not being considered durable. Elsewhere it is used for spear-shafts, scabbards, wheel-spokes, oil-presses and rice-pounders.

It gives a clear almost white gum which is used in N. India; the bark is used for tanning; the branches are lopped for fodder, especially for elephants.

140. **Semecarpus Anacardium,** *Linn. f.* F. B. I. ii. 30; Br. 207; G. 220; C. i. 278; Watt. vi. pt. ii, 498. The Marking Nut tree. Vern. *Bhilawa, bhilwan*

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(Hin.—N. C.; Ni.; Bet.); *Biba* (Mar.—B. C.); *Choso* (Kur.—Mel.); *Kohaka* (Gond.—Seo.; Jub.).

Usually a small tree, with large, alt., simple, entire obovate-oblong, coriaceous leaves, 8-18 in. long. Fls. small, greenish-yellow, fascicled in erect panicles. Fr. an obliquely-ovoid purplish-black drupe, seated in a fleshy orange cup.

Fls. *July-Sep.*; fr. ripens *Jan.-Mar.*; leaves fall, *Jan.-Feb.*; leaves renewed, *May-June.*

Scattered throughout the area, nowhere frequent.

The wood is not used; it contains an acrid juice which causes blister. The orange cup of the fruit is eaten, as also the kernel. The black pericarp yields an ink which is used for marking cotton cloths.

The juice of the pericarp is used in native medicine, in all kinds of skin diseases; it is a powerful vesicant.

141. **Spondias mangifera,** *Willd.* F. B. I. ii. 42; Br. 201; G. 223; C. i. 281; Watt. vi. pt. iii, 338. The Hog-plum. Vern. *Amara, ambara* (Hin.—Jub.; Sau.); *Ambada* (Mar.—Bet.); *Katamba, kekda* (Kur.—Mel.).

A middle sized tree with smooth, thick, whitish bark. Leaves alt., imparipinnate, with 3-5 pr. of elliptic-oblong, glabrous, entire leaflets. Fls. white, in sparingly branched term. panicles. Fr. a yellow plum-shaped drupe 1½ in. long.

Fls. *Feb.-Mar.*; fr. following *Jan.-Feb.*; leaves fall, *Dec.*; leaves renewed, *June.*

Scarce. Near Chipi, Gugamal R., Mel.—(Donald); Bet.; Jub. (not common); Pagara, San. (possibly planted).

The ripe fruit is eaten but it has a very astringent taste. It is readily eaten by deer and other animals.

MORINGACEÆ.

142. **Moringa pterygosperma,** *Gaertn.* F. B. I. ii. 45; Br. 209; G. 224; C. i. 282; Watt. v. 276. The

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Horse-radish tree. Vern. *Munga* (Hin.—N. C.); *Sainjna, senjna, sejna* (Hin.—B. C.); *Sohajna* (Jub.); *Shewaju* (Mar.—Am.).

A small tree with thick corky bark. Leaves alt. tri-pinnate, 12-18 in. long; leaflets ovate or obovate, $\frac{1}{2}$-$\frac{3}{4}$ in. long. Fls. irregular, white, honey-scented, in large ax. panicles. Fr. a pendulous 9-ribbed cylindrical pod 18 in. long.

Fls. *Nov.-Mar.*; fr. *Feb.-June*; leaves fall, *Dec.-Jan.*; leaves renewed, *Jan.-Feb.*

Commonly cultivated and found as an escape near villages. Reported from all Divisions.

The root is used as a substitute for horse-radish. The leaves, fls. and fr. are eaten as a vegetable, and the seeds are made into curry. An oil called Ben Oil is extracted from the seeds which is highly valued by watch-makers. The branches are lopped for fodder.

LEGUMINOSÆ.

I.—PAPILIONACEÆ.

143. **Crotalaria juncea,** *Linn.* F. B. I. ii. 79; Br. 216.; G. 230; C. i. 301; Watt. ii. 595. The Sunn Hemp. Vern. *San* (Hin.—N. C.; B. C.).

An erect shrub 4-6 ft. high, with slender grooved stems and branches, and narrow, simple, alt., linear to oblong leaves, 2-4 in. long. Fls. 1 in. long, yellow, in erect term. and lateral racemes. Pod 1-$1\frac{1}{4}$ in. long, tomentose.

Fls. *Sep.-Jan.*; fr. *Dec.-Feb.* Annual.
Apparently indigenous in some parts of the area. Ni.; Mel.; Chin. Cultivated in all Divisions for its fibre.

144. **Crotalaria sericea,** *Retz.* F. B. I. ii. 75; C. i. 299; Watt. ii. 614. Vern. *Jangli san* (Ni.; Mel.; Sau.); *Bansan* (Jub.; Seo.).

A stout glabrous undershrub 2-4 ft. high, with large leafy stipules, and simple, alt., oblong-lanceolate leaves

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2-6 in. long. Fls. large, yellow, in term. racemes. Pod glabrous, 1-2 in. long.

Fls. *Nov.-Jan.*; fr. *Dec.-Feb.*; biennial—(Haines).

Common along the banks and in the dry beds of streams in the cold weather. Sau.; Jub.; S. Man.; Mel.; Bul.; Ni. and probably other Divisions.

145. **Crotalaria Burhia,** *Ham.* F. B. I. ii. 66.; Br. 216; G. 230; C. i. 292; Watt ii. 595.

A low undershrub with numerous stiff, striate, pubescent branches. Leaves few, inconspicuous, linear or oblong. Fls. yellow, far apart, in racemes forming term. divaricate rigid panicles. Pod $\frac{1}{4}$ in. long, hairy.

Fls. *Nov.-Jan.*; fr. *Dec.-Feb.*

A member of the desert Flora. Only found at Sendwal, Ni., by Duthie.

146. **Indigofera glandulosa,** *Willd.* F. B. I. ii. 94; C. i. 311; Watt. iv. 386. Vern. *Barbada* (Mar.—Yeo.; Am.; Bul.); *Jhujru* (Kur.—Mel.); *Jhujuru* (Sau.).

A small much branched annual herb, clothed with spreading hairs. Leaves alt. 3-foliolate, the leaflets oblanceolate, dotted beneath with translucent glands. Fls. rose-pink in ax. heads. Pod $\frac{1}{3}$ in. long, the edges toothed.

Fls. *Sep.-Dec.*; fr. *Oct.-Feb.*; annual.

Common weed on waste land. Mel.; Yeo.; Am.; Bul.; Ni.; Sau.

The seeds ground into flour and baked into bread are extensively used in times of scarcity; they were thus used in the last famine.

147. **Indigofera trita,** *Linn.* F. B. I. ii. 96; C. i. 315.

An undershrub 2-3 ft. high. Leaves 3-foliolate, leaflets obovate-oblong, clothed with fine appressed hairs, the

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term. leaflet largest. Fls. small, salmon-pink in short racemes. Pods deflexed, 4-angled, spine pointed.

Fls. *Aug.-Oct.*; fr. *Sep.-Nov.*; leaves fall *Jan.*

On waste land, not very frequent. Sau.; Ni. (Burhanpur); Mel.; Bet.; Hosh. (Bori Res.).

148. **Indigofera hirsuta,** *Linn.* F. B. I. ii. 98; C. i. 319.

A low annual or biennial, 2-3 ft. high, covered with soft spreading pubescence. Stipules filiform, plumose. Leaves imparipinnate; leaflets usually 5. Fls. pink, in dense ax. spikes. Pod $\frac{3}{4}$ in., deflexed, densely clothed with spreading hairs.

Fls. *Sep.-Oct.*; fr. *Oct.-Nov.*

On waste land, Mel—(Donald); Ni. (Asirgarh); Sau.

149. **Indigofera argentea,** *Linn.*, var cœrulea. (Syn. Indigofera Houer, *Forsk.*) F. B. I. ii. 98; Br. 218; C. i. 318; Watt. iv. 383.

An erect shrub, 3-5 ft.; stems silvery white. Leaves imparipinnate; leaflets 7-11, obovate. Fls. reddish-yellow, in ax. racemes 1-2 in. long. Pod $\frac{3}{8}$ in. long, thick, curved, slightly constricted between the seeds.

Fls. *Sep.-Nov.*; fr. *Nov.-Jan.*

A single specimen found on waste land in the Civil Station of Khandwa amongst a number of plants of *I. tinctoria*, and once at Punasa, Ni. "Indigenous in the dry districts of the Deccan"—(Brandis).

Extensively cultivated in Egypt as a source of Indigo.

150. **Indigofera tinctoria,** *Linn.* F. B. I. ii. 99; Br. 218; G. 230; C. i. 318; Watt. iv. 387. The Indigo plant. Vern. *Nil* (Hin.).

An erect shrub, 2-3 ft. (but 4-6 ft. under cultivation). Branches, silvery. Leaves imparipinnate; leaflets 9-11, drying a greyish-black. Fls. as in preceding.

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Pod over 1 in. long, linear, deflexed, not constricted between the seeds.

Fls. *Aug.-Oct.*; fr. *Sep.-Nov.*, remaining for many months on the plant; leaves fall, *Dec.-Jan.*; leaves renewed, *May-June*.

This and the preceding are probably, where found in this area, escapes from cultivation. I have always found it near habitations where it quickly runs wild and spreads over considerable areas. Ni.; Mel.; Sau.; Chin.

This is the main source of the dye Indigo and is still cultivated in Bihar and other parts of India, but is rapidly yielding place to the cheap chemical aniline dyes. Between 1883-86 small areas were under cultivation in Ni.

151. **Indigofera pulchella,** *Roxb.* F. B. I. ii. 101; Br. 217; G. 231; C. i. 320; Watt. iv. 387. Vern. *Birhol* (Hin.—Jub.; S. Man.; Hosh.; Chin.; Sau.; Seo.); *Jilra, jirola* (Gond.—Seo.; Ni.; Jub.); *Kondka* (Sau.); *Bhul-bhuli* (Chin.); *Bholori* (Kur—Mel.; Chin.); *Billod* (Ni.); *Jangli nil* (Am.; Bul.).

A tall much branched shrub 4-8 ft. high, with impari-pinnate leaves, and 13-21 leaflets, 1″ long, elliptic-oblong. Fls. ½ in. long, rose-purple, in ax. and term. racemes. Pod 1-1½ in., straight, cylindric, glabrous.

Fls. *Oct.-Feb.*; fr. *Jan.-Apr.*; leaves fall, *Jan.-Feb.*; leaves renewed, *Apr.-May*.

Common in all Divisions chiefly in hilly forest.

The flowers are sometimes eaten as a vegetable.

152. **Millettia auriculata,** *Baker.* F. B. I. ii. 108; Br. 219; G. 233; Watt. v. pt. i, 247. Vern. *Gauj* (Hin.—Sau.; Ni.); *Guhalari* (Jub.; Sau.; S. Man.; Chin.); *Gurar* (Gond.—Chin.; Ni.); *Gorari* (Mel.; Chin.); *Nasbel* (Jub.; Chin.); *Gonja* (Bet.); *Agri* (Ni.).

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A large woody climber, with alt. imparipinnate leaves, and 7-9 obovate-oblong leaflets, 3-6 in. long, silky beneath. Fls. whitish, in numerous ax. racemes 4-9 in. long. Pod flat, rusty-tomentose, 4-6 in. long.

Fls. *Apr.-June*—(Br.; Haines); rains—(Hole); fr. *Jan.-Mar.*—(Haines); cold season—(Hole); evergreen.

Common in the denser forests especially along the shady banks of streams. Jub.; S. Man.; Sau.; Chin.; Hosh.; Mel.; Bul.; Ni.; Bet. and probably in all Divisions.

In dense shade it is frequently a sub-erect shrub. The bark is used to poison fish, and an infusion of the root as an insecticide. The roots are pounded and steeped in water, until the latter has become almost white; the liquid thus obtained is rubbed on horses and cattle to keep off flies. The leaves and branches are lopped for cattle fodder.

153. **Sesbania ægyptiaca,** *Pers.* F. B. I. ii. 114; Br. 219; G. 235; C. i. 328; Watt. vi. pt. ii, 543. Vern. *Jait* (Hin.—Jub.; Sau.); *Saori, sawar, shewari* (Mar.—B. C.); *Dhandan, chilmili* (Ni.); *Silmali* (Chin.).

A shrub or small tree, soft wooded and short lived, 8-12 ft. high. Leaves alt., paripinnate, with 10-20 pr. linear-oblong leaflets ½-1 in. long. Fls. yellow mottled with purple, in lax racemes. Pod thin, torulose, 6-8 in. long.

Fls. *Oct.-Dec.*; fr. *Nov.-Jan.*

Apparently not indigenous in this area. Frequently cultivated, especially in Berar, being used for roofing where bamboos are scare. Planted as a hedge Berar; Ni.; Sau.; Jub.; Seo.; Chin. (Ambara R.); and probably in other Divisions; var. **bicolor,** *W. et A.*, has been collected in Chin.

154. **Sesbania aculeata,** *Pers.* F. B. I. ii. 114; C. i. 328; Watt. vi. pt. ii, 542.

An annual shrub, 5-8 ft. high, with weak prickies on the reddish stems, and alt. paripinnate leaves with

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20-30 prs. of small leaflets. Fls. yellow spotted with red, in lax ax. racemes. Pod slender, not torulose, 6-9 in. long.

Fls. *Sep.-Nov.*; fr. *Oct.-Dec.*; appears in the rains and dies down again in *Feb.*

Common along the edges of tanks and in marshes and wet places. Mel., at low elevations; Ni.; Sau.; Seo. and no doubt throughout the area.

It yields a strong and useful fibre and is cultivated and used in Bengal as a substitute for hemp.

155. **Sesbania grandiflora,** *Pers.* F. B. I. ii. 115; Br. 219; G. 235; C. i. 329; Watt vi. pt. ii, 544. Vern. *Heta* (Mar.—Berar); *Agasta* (Chin.; Sau.).

A small short-lived soft-wooded tree, 20-30 ft., with paripinnate leaves, and 10-30 pr of oblong leaflets, 1-1½ in. long. Fls. very large and showy, red or white. Pod slender, curved, 10-12 in. long.

Fls. *Nov.-Jan.*; fr. *Mar.-May.*

Cultivated in Berar as a substitute for bamboos. Also reported from Chin.; Seo.; Sau.

The leaves, fls. and pods are eaten as a vegetable. The juice of the leaves and fls is used as a popular remedy for nasal catarrh and headache.

156. **Tephrosia purpurea,** *Pers.* F. B. I. ii. 112; G. 234; C. i. 325; Watt. iv. pt. iv. 14. Vern. *Anjan lokariya* (Sau.); *Unhai* (Ni.); *Oti bholori* (Mel.).

A much branched perennial undershrub, 1-2 ft. high. Leaves alt., imparipinnate, with 11-21 oblanceolate leaflets, fine silky hairy beneath. Fls. mauve, in leaf-opposed lax racemes. Pod 1½ in. long, flattened, slightly curved, nearly glabrous.

Fls. *July-Nov.*; fr. *Sep.-Jan.*

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A common weed of waste places. Often gregarious on open ground. Sau.; Ni.; Mel.; Chin., and probably in all Divisions.

The whole plant has medicinal properties. It is used in native medicine as a tonic and laxative.

157. **Tephrosia villosa,** *Pers.* F. B. I. ii. 113; C. i. 326; Watt. vi. pt. iv, 15.

A perennial undershrub with imparipinnate leaves similar to preceding, but the racemes are longer, and calyx and pods are densely fulvous hairy.

Fls. *Sep.-Nov.*; fr. *Oct.-Dec.*

Scarce. Ni. (Asirgarh).

158. **Lespedeza sericea,** *Miq.* F. B. I. ii. 142.

An undershrub with erect slender branches, and close set very shortly petioled 3-foliolate leaves, with linear-cuneate leaflets, ½-1 in. long, silky white beneath. Fls. purplish-white, 2-3 together in the axils of the leaves. Pod ⅛ in. long, 1-seeded.

Fls. *Sep.-Oct.*; fr. *Nov.-Dec.*

Sau. (Damoni Res.); Bet; Chin. (Ambara R.).

159. **Aeschynomene indica,** *Linn.* F. B. I. ii. 151; C. i. 340; Watt i. 126; Vern. *Silari* (Sau.).

A much branched undershrub, 1-3 ft. Leaves alt. imparipinnate; leaflets minute, 21-71. Fls. small, yellow, in 1-4 fld. racemes. Pod 1½ in. long, consisting of 6-10 joints readily separating.

Fls. *Aug.-Dec.*; fr. *Sep.-Jan.*; annual, appearing *June* and dying down in *Mar.*

On waste land, Ni. (Punasa R.); Sau. (Rehli R.); Chin. (Amarwara R.).

160. **Uraria picta,** *Desv.* F. B. I. ii. 155; C. i. 344; Watt. vi. pt. iv, 212. Vern. *Hansia dafar* (Sau.).

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An undershrub, 2-4 ft., with 5-7 foliolate leaves, and linear-oblong leaflets 3-6 in. long, usually blotched with yellow along the midrib. Fls. small, in dense spicate racemes, on bristly pedicels. Pods glabrous, lead coloured, in 3-6 joints folded on one another.

Fls. *Sep.-Oct.*; fr. *Nov.-Dec.*; usually dies down about *Apr.* appearing again with the rains.

In open forest on good soil. Sau.; Hosh.; Chin.; Ni. and probably in all Divisions.

In the Punjab the fr. is used as an application to the sore mouths of children.

161. **Uraria alopecurioides,** *Wight.* (Syn. U. lagopus, *D. C.*) F. B. I. ii. 156. Vern. *Bara boulara* (Sau.).

An undershrub, 2-4 ft. Leaves 3-foliolate, the leaflets ovate, obtuse, blotched with yellow, the term. leaflet twice the size of the basal ones. Fls. in ax. and term. racemes similar to preceding. Pod as in preceding, dark or pale.

Fls. *Sep.-Oct.*; fr. *Nov.-Dec.*; usually dies down about *Apr.* appearing again with the rains.

In open forest. Sau. (Rangir Res., Hatkoh Res.); S. Man. (Motinala R.); Seo. (Ugli R.).

162. **Uraria hamosa,** *Wall.* F. B. I. ii. 156.

An undershrub, 3-4 ft., branches pubescent. Leaves, lower simple, oblong, upper 3-foliolate, the term. leaflet broadly elliptic, 3-5 in. long, softly pubescent beneath. Fls. in very lax ax. and term. racemes, 1 ft. long. Pod as in preceding two species.

Fls. *Aug.-Oct.*; fr. *Nov.-Dec.*

Not as common as preceding two species. Sau. (Rahatgarh Res.).

163. **Ougeinia dalbergioides,** *Benth.* F. B. I. ii. 161; Br. 224; G. 237; C. i. 350; Watt. v. 657. Vern.

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Tinas, *tinsa* (Hin.—N. C.; Ni.; Bet.); *Tiwas*, *tewas* (Mar.—B. C.); *Ruthu* (Kur.—Mel.); *Sar* (Gond.—Seo.; Jub.).

Usually a small tree in this area. Leaves alt. 3-foliolate, the terminal largest, broad-oval, the two lateral opp., obliquely ovate, 3-4 in. long. Fls. whitish or pale-rose in fascicled racemes. Pod linear-oblong, flat, 2-3 in. long, slightly constricted between the seeds.

Fls. *Feb.-Apr.*; fr. *Apr.-June*; leaves fall, *Jan.-Feb.*: leaves renewed, *Apr.*

Throughout the area, sometimes in gregarious patches. Owing to the great demand for the wood very few sound trees of any size are now available.

A valuable wood, tough, and durable and, in much request for agricultural implements. The bark is pounded and used to intoxicate fish; it is also said to be used as a febrifuge.

164. **Desmodium Cephalotes,** *Wall.* F. B. I. ii. 161; Br. 222; G. 238; C. i. 352; Watt. iii. 81. Vern. *Chipti* (Bet.).

A shrub 4-8 ft., with triangular silky branches. Leaves alt., 3-foliolate. Leaflets elliptic-lanceolate, 2-4 in. long, sec. nerves 10-14 prs., prominent beneath, and silky. Fls. red, crowded in dense ax. very shortly stalked heads. Pod ½ in. long, slightly curved, very silky, of 3-6 joints.

Fls. *Aug. Sep.*; fr. *Oct.-Dec.*; leaves fall, *Jan.-Feb.*; leaves renewed, *Apr.-May.*

As undergrowth in the denser forests, but not very frequent. Sau. (Jujharghat); Bet.; Mel.; Hosh.

165. **Desmodium pulchellum,** *Benth.* F. B. I. ii. 162; Br. 223; G. 239; C. i. 353; Watt. iii. 83. Vern. *Dhakna* (S. Man.); *Chikati* (Seo.).

A shrub 3-5 ft. with grey downy branches. Leaves alt., 3-foliolate, petioles channelled above. Leaflets ovate-elliptic, the terminal 2-5 in. long, twice the size

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of the lateral ones. Fls. in. long ax. and term. racemes, which bear double rows of 2-foliolate orbicular bracts completely concealing the minute yellow fls. Pod small, 2-jointed.

Fls. *Aug.-Oct.*; fr. *Nov.-Dec.*; leaves fall, *Feb.-Mar.* (?); leaves renewed, *May*.

As undergrowth in the denser forests. Jub.; Sau. (Ghat Piparia); S. Man.; Seo.

Used in S. Man. to remove bugs from beds and furniture—(Kenny).

166. **Desmodium laxiflorum,** *D.C.* F. B. I. ii. 164; Br. 223; C. i. 353.

An undershrub, 2-4 ft. clothed with short appressed hairs. Leaves alt. 3-foliolate, similar to preceding but usually larger. Fls. usually in distant few-fld. fascicles, arranged in ax. and term. racemes 6-12 in. long. Bracts inconspicuous. Pod 1-1½ in., of 6-10 joints clothed with minute hooked hairs.

Fls. *Aug.-Oct.*; fr. *Oct.-Dec.*; leaves fall, *Jan.*

As undergrowth in valleys in shady forest. Jub.; Sau. (Gorjhamar Res., Basa Res.); Mel.—(Donald).

167. **Desmodium polycarpum,** *D.C.* F. B. I. ii. 171; Br. 223; C. i. 354; Watt iii. 83. Vern. *Jogilat* (S. Man.).

An erect undershrub, 2-4 ft., with hairy branches. Leaves alt. 3-foliolate; leaflets elliptic-obovate, glabrous above. Fls. purple in dense ax. and term. often panicled racemes 1-3 in. long. Pod ½-¾ in. long brown, hairy, 5-6 jointed, joints dehiscent.

Fls. *Aug.-Oct.*; fr. *Nov.-Jan.*

A widely distributed species, but so far only reported from two Divisions. S. Man. (Karanjia); Pachmarhi, Hosh.—(Haines).

The Santals are said to use a preparation of the plant in fainting and convulsions.

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168. **Desmodium gangeticum,** *D.C.* F.B.I. ii. 168; Br. 224; C. i. 356; Watt. iii. 82. Vern. *Chirpat* (Sau.); *Chuppa* (S. Man.).

An undershrub, 2-3 ft., with angled branches clothed with appressed hairs. Leaves simple, alt., ovate-oblong, base rounded, pubescent beneath. Fls. white or reddish-purple, in ascending ax. and term racemes 6-12 in. long. Pod falcate, $\frac{3}{4}$ in. long; joints 6-8, longer than broad.

Fls. *July-Oct.*, also *Jan.-Feb.*; fr. *Sep.-Dec.*; leaves frequently turn red before falling in *Dec.-Jan.*

Common as undergrowth in all but the driest forests. Sau.; Jub.; S. Man.; Mel.; Hosh.; Seo.; Chin. and probably in all Divisions.

The plant is regarded as a febrifuge and anti-catarrhal and is used in native medicine.

169. **Desmodium latifolium,** *D. C.* F. B. I. ii. 168; Br. 224; C. i. 356; Watt, iii. 82. Vern. *Chirpat* (Sau.; Chin.); *Poti* (Mel.; a general name for the genus); *Chikati* (Seo.).

An erect undershrub, 2-4 ft.; branches terete clothed with short fulvous hairs. Leaves simple, alt., broadly-ovate, 3-6 in. long, base truncate, pubescent on both surfaces. Fls. purple, in ax. and term. racemes, 2-12 in. long. Pod $\frac{3}{4}$ in. long, straight, joints 4-6, about as broad as long.

Fls. *Aug.-Oct.*; fr. *Sep.-Dec.*; leaves frequently turn red before falling in *Dec.-Jan.*

Common as undergrowth in all but the driest forests. Sau.; Hosh.; S. Man.; Seo. Common in valleys, Mel.—(Donald); Ni.; Chin. (Sillewani R.), and probably in all Divisions.

170. **Desmodium gyrans,** *D. C.*, var. Roylei. F. B. I. ii. 174; C. i. 358.

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An erect undershrub, 2-4 ft. Leaves 1-3 foliolate; leaflets oblong-lanceolate, pubescent beneath, the terminal 2″-4″ by 1″, the lateral ½″-1″, very narrow. Fls. in ax. and term. racemes 2-6″ long, with large ovate bracts concealing the fl. buds. Pod 1½″ long, curved; joints 5-10, hairy.

Fls. *Aug.-Oct.*; fr. *Nov.-Dec.*

In Sal forests, Jub.; S. Man.

The two lateral leaflets move spontaneously by jerks in warm damp weather; hence the name.

171. Abrus precatorius, *Linn.* F. B. I. ii. 175; Br. 225; G. 240; C i. 359; Watt. i. 10. Vern. *Gunchi, gun* (Hin., Mar.—N. C.; B. C.).

A slender twining shrub, with alt. paripinnate leaves 2-4″ long terminating in a short bristle. Leaflets 10-20 pr, ½″ long. Fls. pale mauve, in crowded racemes Pod 1½″ long, opening on the plant and displaying the bright red seeds with a black eye, commonly known as "crab's eyes." More rarely the seeds are found quite white.

Fls. *Sep.-Oct.*; fr. *Nov.-Feb.*; leaves fall, *Jan.-Feb.*

Common in hedges throughout the area.

The seeds are used as weights by Indian goldsmiths; they are also used to poison cattle. The powdered root is used for coughs.

171a. Shuteria vestita, *W. et A.* F.B.I. ii. 181; C. i. 361.

A slender twining herb; stems woody. Leaves 3 foliolate; leaflets membranous, the term. rhomboid-obovate, 1¼″-1½″ long, the lateral slightly smaller, ovate-oblong, more or less pubescent on both sides. Fls. purplish-red in ax. dense racemes 1″-4″ long. Pod linear, 1″-1¼″ long, hairy, slightly recurved.

Fls. *Oct.*

Only reported from Hosh. (Pachmarhi)—Hole.

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172. **Teramnus labialis,** *Spreng.* F. B. I. ii. 184; C. i. 363; Vern. *Urdua* (Sau.).

A slender, more or less hairy climber. Leaves 3-foliolate; leaflets ovate or rhomboid, 1½-2″ long, glabrous above. Fls. reddish, in few fld. ax. racemes 2-6″ long. Pod 2″ long, linear, beaked.

Fls. *Aug.-Oct.*; fr. *Nov.-Dec.*

In hedges. Jub.; Sau.; Ni. A widely spread species and probably to be found throughout the area.

173. **Mucuna pruriens,** *D. C.* F. B. I. ii. 187; Br. 226; G. 240; C. i. 365; Watt. v. 286. Vern. *Kiwanch* (Hin.—Jub.; Ni.; Bet.; Chin.; Seo.); *Karench* (Sau.; Chin.); *Kanchkuri* (Mar.—B.C.); *Maholijanta* (Gond.—Seo). "Cowitch" of Anglo-Indians.

An annual twiner climbing to considerable heights. Leaves 3-foliolate; leaflets 3-5″ long, rhomboid-ovate, lateral leaflets very inequilateral. Fls. 1-1½″ long, deep purple, in elongate racemes 6-12″ long. Pod 2-3″, curved at both ends like the letter S and densely clothed with persistent pale brown irritant bristles

Fls. *Aug.-Oct.*; fr. *Nov.-Jan.*; annual.
Common in hedges in the rains throughout the B. C. Also in Jub.; Sau.; Chin.; Seo., and no doubt the whole N.C.

The hairs of the pod have long been used as a vermifuge in European medicine.

174. **Erythrina indica,** *Lamk.* F. B. I. ii. 188; Br. 226; G. 242; C. i 366; Watt. iii 269. The Indian Coral tree. Vern. *Pangra, pangara* (Hin., Mar.—B. C.; Chin.).

A medium sized tree under favourable conditions with smooth yellowish bark, armed with small prickles. Leaves alt. 3-foliolate; leaflets 4-6″ long, rhomboid-ovate. Fls. large, bright red, in dense racemes 4-9″ long. Pod 5-12″ long, torulose.

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Fls. *Mar.*; fr. *July-Aug.*; leaves fall, *Jan.*; leaves renewed, *May*.

Throughout Berar. Large stakes stuck in the ground quickly take root; it is therefore much cultivated for live fences, and for supports for the betel and pepper vine. It is mainly a coast plant, and therefore doubtfully indigenous in Berar. Also reported from Chin.

In Berar the wood is used for making toys.

175. **Erythrina suberosa**, *Roxb.* F. B. I. ii. 189; Br. 227; G. 241; C. i. 367; Watt. iii. 270. Vern. *Haruwa*, *harwa* (Jub.; Sau.; S. Man.; Hosh.; Seo.; Chin.); *Pangra* (Mar.—Bul.; Yeo.; Chin; Seo.); *Gadha palas* (Ni.; Am.; Chin.); *Nagthada* (Mel.); *Gadaphad* (Kur.—Mel.).

A small to medium sized tree according to locality, with yellowish, corky, deeply cracked bark. Leaves 3-foliolate like preceding, but densely brown tomentose beneath. Fls. smaller than preceding, in capitate racemes 2-4 in. long. Pod 5-6 in. long.

Fls *Mar.-May*; fr. *July-Sep.*; leaves fall, *Nov.*; leaves renewed, *June*.

In hilly localities throughout the area.

The wood is light and is used for scabbards, household utensils, etc.

176. **Galactia tenuiflora**, *W. et. A.* F.B.I. ii. 192; C. i. 369. Vern. *Bansemar*. (Sau.).

A herbaceous twiner. Leaves 3-foliolate; leaflets 1-2 in. long. elliptic-oblong, pubescent beneath. Fls. bluish-purple, in racemes 3-6 in. long. Pod. 1½-2 in., linear, flattened.

Fls. and fr. *Aug.-Sep.*

Sau. (Pagara); var. **latifolia**, *Baker*, is reported from Mel.—(Donald).

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177. **Spatholobus Roxburghii,** *Benth.* F. B. I. ii. 193; Br. 229; G. 243; C. i. 370; Watt. vi. pt. iii, 319. Vern. *Mula* (Hin.).

A large woody climber with fluted stem, attaining 2-3 ft. girth. Leaves 3-foliolate; leaflets 4-6 in. long, broadly elliptic, the lateral ones unequal sided, silky beneath. Fls. white or cream coloured, in dense panicled racemes. Pod 3-5 in. long, brown tomentose, with a single apical seed.

Fls. *Aug.-Jan.*; fr. *Dec.-Apr.*

Scarce. Jub.; Mel.; Seo.; but possibly it has been overlooked in other Divisions. In the Mel. it is said to do some damage and has to be cut out. It is reported as planted in Am., but for what purpose is not stated. I have neither collected specimens, nor seen any from this area.

The bark yields a fibre suitable for coarse rope.

178. **Butea frondosa,** *Roxb.* F. B. I. ii. 194; Br. 230; G. 243; C. i. 371; Watt. i. 548. Vern. *Palas* (Hin., Mar.—N. C.; B. C.); *Cheola* (S. Man.; Jub.; Sau.); *Makra* (Hosh.); *Pharsa* (Kur.—Mel.); *Mur* (Gond.—Seo.; Jub.).

The well-known "Flame of the Forest." A moderate sized tree. Leaves 3-foliolate; leaflets coriaceous, the term. 4-8 in. long, broadly obovate, the lateral smaller and inequilateral. Fls. orange-red, in rigid racemes 6 in. long. Pod 4-7 in. long, flat, with a single apical seed.

Fls. *Feb.-Apr.* when leafless; fr. *May-June*; leaves fall, *Jan.-Feb.*; leaves renewed, *Apr.-May.*

Very common throughout the area especially on black cotton soil. The brilliant orange-red flowers which cover the tree in *Mar.* and *Apr.* before the young leaves appear are a conspicuous feature in the otherwise brown landscape.

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The fibre of the root is extensively used for rope. The wood is used for fuel. A yellow dye is obtained from the flowers. A gum known as Bengal kino is obtained from the bark. Lac is cultivated on this tree. The seeds are used as a vermifuge.

A variety "**lutea**" as identified by the Supdt., Royal Botanic Gardens, Calcutta, with lemon yellow fls. is found in the Kinwat Reserve, Yeo.

179. **Butea superba,** *Roxb.* F. B. I. ii. 195; Br. 230; G. 245; C i. 372; Watt i. 556. Vern *Belia palas, palasvel* (Mar.–B. C.); *Badori bel, budna bel* (S. Man.); *Bhador chiola, bhadrosi* (Jub.); *Bhonria chiola* (Jub.; Sau.); *Bela palas* (Chin.; Seo.; Dam.; Jub.); *Tunang* (Kur.).

A large climber, stem up to 2 ft. girth. Leaves, fls. and pod similar to preceding but larger, the terminal leaflet 6-15 in. long.

Fls. *Mar.-Apr.*; fr. *June-July*; leaves fall, *Jan.*; leaves renewed, *May*.

Throughout the area.

The economic properties are very similar to those of B. frondosa.

180. **Canavalia ensiformis,** *D.C.* F. B. I. ii. 195; C. i. 373; Watt. ii. 97. Vern. *Bari sem* (Hosh.). Sword-bean.

A stout perennial twiner. Leaves 3-foliolate; leaflets 2-3 in. long, ovate, glabrous. Fls. 1½ in. long, rose-lilac, on the swollen nodes of elongate racemes. Pod 6 in. long, thick, fleshy, winged on either side of the upper suture.

Fls. *Aug.-Dec.*; fr. *Oct.-Mar.*

An escape, doubtfully wild, found throughout the Mel.; Hosh. (Ratakhas); Ni.; Chin. (Ambara R.); Sau. (Rehli R.).

Cultivated for the pods which are eaten as a vegetable.

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181. **Pueraria tuberosa,** *D.C.* F. B. I. ii. 197 ; Br. 228 ; G. 245 ; C. i. 374 ; Watt. vi. pt. i, 363. Vern. *Bharda* (Hin —S. Man. ; Chin. ; Dam. ; Seo. ; Hosh. ; Sau.) ; *Ghorbel* (Mar.—B. C.).

A large climber with woody tubercled stem. Leaves 3-foliolate ; leaflets 5-8 in. long, the terminal nearly as broad as long, the two lateral very unequal sided, silky hairy beneath. Fls. blue-purple, in long fascicled racemes, before the new leaves appear. Pod 2-3 in. long, flat, clothed with long rusty hairs.

Fls. *Feb.-Apr.* ; fr. *June-Aug.* ; leaves fall, *Jan.* ; leaves renewed, *May.*

In hilly forests and valleys throughout the area.

The roots form large globose tubers, which are eaten, and used in medicine. The leaves are excellent fodder for horses and cattle—(Donald).

182. **Phaseolus trilobus,** *Ait.* F. B. I. ii. 201 ; C. i. 376 ; Watt. vi. pt. i, 194. The Kidney bean.

Annual or perennial with prostrate wiry stems. Leaves 3-foliolate, the leaflets 3-lobed. Small yellow fls. in long peduncled racemes. Pod 1-2 in. long, sub-cylindric.

Fls. *Oct.*

Found in Ni. and Jub. by Duthie.

Cultivated by the poorer classes as a food crop.

183. **Phaseolus trinervius,** *Heyne.* F. B. I. ii. 203 ; C. i. 377 ; Watt. v. pt. ii, 72.

A slender perennial twiner, covered with long rufous hairs. Leaves 3 foliolate, the leaflets not or scarcely lobed. Fls. as in preceding. Pod 2 in. long, densely rufous hairy.

Mel. 3,500 ft.—(Donald).

The seeds of the pod are edible and are used in times of scarcity.

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184. **Phaseolus radiatus,** *Linn.* (Syn. P. Mungo, *Roxb.*). F. B. I ii. 203 ; C. i. 378 ; Watt. vi. pt. i, 187. Vern. *Mung* (Hin.).

Annual, sub-erect, and twining, closely allied to the preceding. Leaflets entire.

This species is not uncommonly cultivated. It is included here as it is found wild in the Pachmarhi hills, Hosb.

185. **Vigna vexillata,** *Benth.* F. B. I. ii. 206 ; C. i. 379.

A perennial hairy twiner. Leaves 3-foliolate ; leaflets with 3-basal nerves. Fls showy, purplish-white at the ends of ax. peduncles. Pod 4 in. long, slender, glabrous.

Mel. 3,500 ft.—(Donald) ; Chin. (Amarwara. R.) ; Sau. (Pagara).

186. **Clitorea ternatea,** *Linn.* F. B I ii. 208 ; C. i. 380 ; Watt. ii. 375. Vern. *Bismar* (Sau.).

A perennial twiner. Leaves imparipinnate ; leaflets 5-7, elliptic-oblong, 1·2 in. long. Fls. bright blue, or sometimes white with a yellow centre, ax., solitary. Pod 2-4 in long, flattened, slightly hairy.
Fls. *July-Oct.* ; fr. *Sep.-Dec.*

Indigenous and common in hedges, Sau., Ni. and probably throughout the area. In Jub. it is reported as cultivated in gardens and run wild in hedges.

The root and seeds are used in medicine as a cathartic and laxative.

187. **Dolichos Lablab,** *Linn.* F. B. I. ii. 209 ; C. i. 381 ; Watt. iii. 183. Vern. *Sem* (Hin.); *Janta* (Gond. –Seo.).

A perennial twiner, or under cultivation annual. Leaves 3-foliolate ; leaflets broadly ovate, pubescent, base 5-nerved. Fls. reddish or white, in term. racemes 3-6 in. long, on long peduncles. Pod 2 in. long, wider at the base.

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Fls. *Nov.-Dec.*; fr. *Dec.-Jan.*

Common along the sandy banks of rivers in the cold season. Ni.; Sau.; Jub.; Seo. and probably elsewhere.

Frequently cultivated for its pods which are eaten.

188. **Dolichos biflorus,** *Linn.* F. B. I. ii. 210; C. i. 382; Watt. iii. 175. Horse gram.

A perennial twiner, hairy all over. Leaves 3-foliolate. Fls. yellow, ax., on a short peduncle. Pod. 2 in. long, hairy, falcate.

Fls. *Oct.-Nov.*; fr. *Nov.-Dec.*

Wild in the Pachmarhi hills—(Haines).

Cultivated both as a green manure and a food crop mainly in Madras, to a small extent in the S. Circle, C. P. and hills of the Punjab.

189. **Atylosia crassa,** *Prain.* C. i. 383. Vern. *Bansem* (Jub.; Sau.; Seo.; Chin.).

A small tomentose twiner. Leaves 3-foliolate; leaflets stipellate, 2-3 in. long, rhomboid-obovate. Fls. yellow, in racemes 2-3 in. long. Pod 1½ in. long, straight, depressed between the seeds.

Fls. *Nov.-Dec.*; fr. *Dec.-Jan.*

Fairly common in hedges. Sau.; Jub.; Seo.; Chin.; Mel. (Gugamal R.).

190. **Atylosia scarabæoides,** *Benth.* F. B. I. ii. 215; C. i. 384. Vern. *Chukarkheti* (Sau.); *Ran tur* (Ni.); *Jangli tur* (Mel.).

A small herbaceous pubescent twiner. Leaves 3-foliolate, exstipellate; leaflets 1-1½ in. long, elliptic, strongly nerved beneath. Fls. yellow, on short ax. peduncles. Pod 1 in. long, hairy, with deep transverse lines between the seeds.

Fls. and fr. *Aug.-Nov.*

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Common in hedges, Sau.; Ni.; Ak.; Mel. (at low elevations); Chin.; Seo. (Khurai R.); and probably throughout the area.

The seeds are said to be eaten.

191. **Cylista scariosa,** *Roxb.* F. B. I. ii. 219; C. i. 386. Vern. *Bansem* (Sau.).

A woody twiner. All parts downy. Leaves 3-foliolate; leaflets 2-4 in. long, the term. rhomboid-ovate, the lateral obliquely ovate, gland-dotted beneath. Fls. yellowish and red, in ax. racemes. Most characteristic are the enlarged greenish white membranous sepals completely enclosing the small yellow petals and easily mistaken for the petals themselves. Pod small, 1-seeded.

Fls. *Nov.-Jan.*; fr. *Dec.-Feb.*

In hedges in moist localities. Jub.; Sau. (Mokalpur); Bet.; Hosh.; Ni. (Kalibhit R.); Mel. (at low elevations).

192. **Rhynchosia cyanosperma,** *Benth.* F. B. I. ii. 222; C. i. 388.

A woody climber, clothed with short grey or brown pubescence. Leaves 3-foliolate; leaflets 2-4 in. long, rhomboid-ovate, acuminate, velvety on both surfaces. Fls. in long peduncled, close racemes. Calyx chaffy, ⅔ in. long, enclosing the yellowish-white corolla. Pod ½ in. long, torulose, velvety.

Fls. *Oct.-Dec.*

In hedges in Chikli and Mehkar, Bul.

193. **Rhynchosia minima,** *D.C.* F. B. I. ii. 223; C. i. 388. Vern. *Choti bansem* (Sau.).

A twining annual. Leaves 3-foliolate; leaflets 1-2 in. long, rhomboid ovate, gland-dotted beneath. Fls. small, yellow, in lax ax. racemes 2-4 in. long. Pod ½ in. long, flat, curved, 2-seeded.

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Fls. and fr. *Sep.-Nov.*

Common in hedges, Sau ; Ni. ; Mel.

194. **Rhynchosia viscosa,** *D.C.* F. B. I. ii. 225.

A stout woody twiner, all parts clothed with grey viscous pubescence. Leaves 3-foliolate ; leaflets 1½-3 in. long, as broad as long. Fls. yellow veined with purple, in long peduncled racemes, extremely sticky. Pod 1¼ in. long, pubescent, straight, narrowed at both ends.

Fls. *Aug.-Sep.* ; fr. *Sep.-Oct.*

In hedges, Ni.

195. **Rhynchosia sericea,** *Spanoghe.* F. B. I. ii. 225. Vern. *Bansem* (Sau.).

A woody twiner, clothed with dense soft grey pubescence. Leaves 3 foliolate ; leaflets 2-4 in. long and as broad, pubescent on both surfaces. Fls. yellow, numerous, moderately close together, at the end of a long peduncle. Pod 1 in. long, pubescent, recurved, narrowed towards the base.

Fls. *Aug.-Sep.* ; fr. *Sep.-Oct.*

In hedges, Sau. ; Ni. (Chandni R.) ; Seo. (Ugli R.).

196. **Flemingia strobilifera,** *R. Br.* F. B. I. ii. 227 ; Br. 231 ; G. 246 ; C. i 390 ; Watt. iii. 403.

A much branched shrub, 4-8 ft., branches terete. Leaves simple, alt., ovate lanceolate, 2-6 in. long with 6-8 pr. of conspicuous sec. nerves. Inflorescence in ax. racemes of small white fls., usually in prs. in the axils of large membranous, broadly orbicular, folded acuminate bracts. Pod small, pubescent, completely concealed by the bracts which turn brown when in fr.

Fls. *Dec.-Mar.* ; fr. *Jan.-Apr.* ; evergreen.

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In shady forest and along streams, Sau. (Jujharghat Chain Res.). In dense shade on sandy riverine tracts, Mel.; Ni. (Chandgarh Res.).

The root is used by the Santals as a cure for epilepsy.

197. **Flemingia bracteata,** *Wight.* F. B. I. ii. 227; Br. 231; G. 246; C. i. 391.

An erect shrub 1-3 ft., much resembling preceding and formerly united with it. The main points of difference are (1) the branches are prominently angled and shaggy with long hairs, (2) fewer lateral nerves, usually 4-6 pr., (3) the apex of the bract is rounded or emarginate, (4) whole bract is hirsute.

Fls. *Dec.-Mar.*; fr. *Jan.-Apr.*

Common in Sal forest, Jub.; S. Man.; Hosh. (Pachmarhi); Seo. (Nerbudda R.).

198. **Flemingia paniculata,** *Wall.* F.B.I. ii. 227; Br. 232.

A shrub 4-6 ft. with rusty branches. Leaves simple, ovate, cordate, 5 in. long. Fls. small, white or reddish, in hairy ax. and term. panicled racemes, with small ovate bracts. Pod ½ in. long, downy.

Fls. *Feb.-Apr.*

S. Man. (Dindori R.); Seo.

199. **Flemingia lineata,** *Roxb.* F. B. I. ii. 228; Br. 232; C. i. 391.

A small erect shrub 2-4 ft. Leaves 3-foliolate; leaflets 1-3 in. long, obovate-lanceolate, the terminal the largest, with 3 basal nerves very conspicuous on the under side. Fls. small, crimson, in ax. panicles. Pod less than ½ in., rounded at both ends, pubescent.

Fls. *Nov.-Jan*; fr. *Feb.-Mar.*

A small shrub of hedgerows, Jub.—(Hole); Sau. (along the Dehar river, Rangir Res.). In untilled fields, Mel. 1 100 ft.; Bet. (Motha); Ni. (Kalibhit R.).

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200. **Flemingia congesta,** *Roxb.*, var. semialata. F. B. I. ii. 228; Br. 232; G. 246; C. 392; Watt. iii. 400. Vern. *Dakna* (S. Man.).

An erect shrub, 3-6 ft., with pubescent, angular, grooved branches. Leaves 3-foliolate; leaflets, 3-5 in. long, elliptic, strongly 3-nerved from the base, glabrous above. Fls. purple in dense bracteate, ax. spikes. Pod ½ in. long, apiculate, pubescent.

Fls. and fr., *Nov.-Dec.*; leaves renewed, *Apr.-May.*

Along banks of streams. S. Man. (Amarkantak); Hosh.

This and some allied species produce the 'waras' dye of Africa, a yellow dye suitable for dying silk and wool.

201. **Flemingia nana,** *Roxb.* F. B. I. ii. 229; Br. 232; C. i. 391.

A dwarf undershrub, with woody root-stock, sending up annually large 3-foliolate leaves, with winged petioles; leaflets 5-8 in. long, term. obovate, lateral oblique. Fls. reddish, in ax. racemes 3-4 in. long. Pod ⅓ in. long, covered with viscid reddish glands.

Fls. *Mar.-Apr.*; fr. *Apr.-May.* Leaves die off in the hot season.

In shady forest. Sau.; Mel.

202. **Dalbergia Sissoo,** *Roxb.* F. B. I. ii. 231; Br. 233; G. 247; C. i. 395; Watt. iii. 13. Vern. *Sissu* (Hin.—N. C.; B.C.).

Usually a middlesized tree in this area. Leaves alt. imparipinnate; leaflets 3-5, sub-orbicular, acuminate, 1-2 in. long, glabrous. Fls. yellowish, in ax. panicles. Pod strap-shaped, thin, 1-3 in. long, glabrous.

Fls. *Mar.-Apr.*; fr. *May* onwards, ripening in the cold weather, and remaining on the tree until the following *Mar.*; leaves fall, *Feb.-Mar.*; leaves renewed, *Mar.-Apr.*

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Not indigenous, but planted as an avenue tree. Jub.; Sau.; Dam.; S. Man.; Seo.; Mel.; Am.; Ni.

Does not thrive very well in Berar.

A valuable timber, durable and seasons well. Extensively used in N. India for furniture, carts and carriages, boat building, construction, and agricultural implements.

203. **Dalbergia latifolia,** *Roxb.* F. B. I. ii. 231; Br. 233; G. 250; C. i. 396; Watt. iii. 7. Rosewood. Vern. *Shisham* (Hin., Mar.—N. C.; B. C.); *Siris* (Gond.—S. Man.); *Sison* (Jub.; Sau.); *Siase* (Sau.); *Botbiola* (Berar); *Bodbera, biola* (Yeo.).

A small tree in this area, very similar to preceding, but leaflets are 5-7, and obtuse or emarginate at the apex. Fls. white, in ax. panicles. Pod strap-shaped, glabrous.

Fls. *Sep.*; fr. *Jan.-Feb.*; leaves fall, *Jan.*; leaves renewed, *Apr.*

Throughout the area; fairly common in the Berar Circle, less common in the N. C. Usually in hilly localities. Sau. (Chandapur Res., Jallandhar Res., Shahgarh Res.). In Berar it has been very much overworked.

The dark purple heartwood is highly prized as a furniture wood both in India and Europe. It is also used for cart wheels, gun-carriages and agricultural implements.

204. **Dalbergia paniculata,** *Roxb.* F. B. I. ii. 236; Br. 236; G. 254; C. i. 399; Watt. iii. 11. Vern. *Dhoben* (Hin.—Jub.; Sau.; Chin.; Dam.; Seo.); *Dhobni* (S. Man.); *Phansi* (Jub.; Chin.; Am.; Ni.; Bet.); *Padri* (Gond.—Jub.; Yeo.; Am.); *Passi* (Kur.—Mel.).

A tall straight tree with smooth grey bark. Leaves alt. imparipinnate; leaflets 9-13, rounded, ¾-1 in. long, turning black in drying. Fls. bluish-white, in numerous term. panicles. Pod flat, narrowed at both ends, 1-2 seeded, turning black on the tree.

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Fls. *May-July*; fr. *Nov.-Jan.*; leaves fall, *Feb.-Mar.*; leaves renewed, *June*.

Common throughout the area. The wood is arranged in concentric bands of hard and soft tissue, which serve to distinguish the tree when cut. They render the wood useless.

Lac is occasionally found on this tree.

205. **Dalbergia lanceolaria,** *Linn.* F. B. I. ii. 235; Br. 236; G. 253; C. i. 399; Watt. iii. 6. Vern. *Aian* (Sau.); *Dhamasi* (Ni.).

A large tree with smooth grey bark, very similar to preceding, and not readily distinguished from it. The leaflets are usully more numerous, 11-17 and do not turn black when dry, and the sec. nerves are more prominent. Fls. pale pink, in copious panicles. Pod 1-3 seeded.

Fls. *Apr.-May*; fr. *Nov.-Jan.*; leaves fall, *Feb.-Mar.*; leaves renewed, *Apr.-May*.

Rare, but as it so closely resembles *D. paniculata*, it has probably been overlooked in some Divisions. So far it has been found in Jub. (not common); S. Man.; Sau. (Gundraj Res.); Mel. (near Ghatang); Yeo.; Ni. (Punasa Res.). In none of these areas is it common.

The wood is of good quality, but it is not in sufficient quantity to be used in this area.

206. **Dalbergia volubilis,** *Roxb.* F. B. I. ii. 235; Br. 237; G. 254; C. i. 400; Watt. iii. 16. Vern. *Birach* (Jub.).

A large climbing shrub, with long green branches, which are often twisted into spiral hooks. Leaves similar to preceding but fewer leaflets, 9-13. Fls. pale blue, in large ax. and term. panicles. Pod flat, conspicuously veined, usually 1-seeded.

Fls. *Feb.-Mar.*; fr. *May-June*.

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In shady forest and along streams, but not very common. Jub.; Sau. (Shahgarh Res.); Ni. (Kalibhit R.); Mel.; Seo.

207. **Pterocarpus Marsupium,** *Roxb.* F. B. I. ii. 239; Br. 240; G. 261; C. i. 401; Watt. vi. pt. i, 357. Vern. *Bija, bija sal* (Hin.—N. C.; B. C.); *Ragatbera, bera* (Yeo.); *Dhorbiola* (Mar.—Am.).

A large tree with rough grey bark. Leaves alt. imparipinnate; leaflets 7-9, elliptic, closely parallel veined, shining. Fls. yellow, with crisped petals, in ax. and term. panicles. Pod flat, nearly circular, 1-seeded.

Fls. *Aug.-Oct.*; fr. *Oct.-Dec.*; leaves fall, *Mar.-May*; leaves renewed, *June*; almost evergreen in moist localities.

In all Divisions, widely distributed, but nowhere very plentiful.

A valuable timber tree. The wood is durable and seasons well. It is used for construction, furniture, agricultural implements, cart and boat building. A red gum resin called "kino" is obtained from wounds in the bark and used in medicine as an astringent. The leaves are used for fodder, and in Berar at one time it was nearly exterminated through systematic lopping for cattle.

208. **Pongamia glabra,** *Vent.* F. B. I. ii. 240; Br. 243; G. 262; C. i. 402; Watt. vi. pt. i, 322. Vern. *Karanj, karanji* (Hin., Mar.—N. C.; B. C.); *Kanji* (Hin.—Chin.; Jub.; Dam.); *Gangaji* (Gond.—Seo.).

A middle sized tree with smooth grey bark. Leaves alt. imparipinnate, with 5-7 ovate, dark green, shining leaflets. Fls. pale mauve, fascicled on short ax. racemes. Pod ¾ in. thick, flattened, woody, indehiscent, oblong, 1½-2 in. long.

Fls. *May-July*; fr. ripens *Feb.-Apr.*; evergreen in moist localities; elsewhere leaves fall *Mar.*; leaves renewed, *Apr.*

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Very commonly planted as an avenue tree as it is almost evergreen and gives dense shade. It is reported from all Divisions, but whether truly wild or only planted is uncertain. It occurs wild in Sau. fairly commonly, along perennial streams; also in Ni.; Hosh. and probably in other Divisions.

In Bengal the wood is used for oil mills and fuel. An oil is expressed from the seeds which is used for burning, and medicinally, especially for skin diseases.

209. **Derris scandens,** *Benth.* F. B. I. ii. 240; Br. 241; G. 263; C. i. 404; Watt iii. 81. Vern. *Nikada* (Yeo.).

A large woody climber with pendant branches. Leaves alt., imparipinnate; leaflets 9-11, elliptic-oblong, shining, 2-3 in. long. Leaf rachis channelled. Fls. pale rose on slender pedicels, fascicled in long ax. racemes 4-10 in. long. Pod 1-3 in. long, flat, tapering at both ends, narrowly winged on the upper suture.

Fls. *Aug.-Sep.*; fr. *Nov.-Dec.*

Yeo. (Kinwat Res.).

The bark yields a coarse rope fibre.

210. **Sophora interrupta,** *Bedd.* F. B. I. ii. 251; Br. 244; G. 264.

A tall erect shrub, with imparipinnate leaves, and 19-29 leaflets, obtuse, emarginate, 1 in. long. Fls. yellow, in ax. racemes 2-4 in. long. Pod moniliform, 3-4 in. long, 2-4 jointed, the joints with 4 narrow wings.

Fls. *Oct.-Dec.*; fr. *Jan.-Feb.*

An interesting species so far only found at Pachmarhi, Hosh. and in Chin. (Amarwara R.). It occurs outside the area in the hills of the Deccan.

The following non-indigenous plants are extensively cultivated:—

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211. **Cajanus indicus**, *Spreng.* F. B I. ii. 217; Watt. ii. 49. Vern. *Arhar* (Hin.); *Tur* (Mar.).

212. **Cicerarietinum**, *Linn.* F. B. I. ii. 176; Watt. ii. 274. Gram or Chick Pea. Vern. *Channa*. Horses are largely fed on this pea.

II.—CÆSALPINIÆ.

213. **Cæsalpinia Bonducella**, *Flem.* F. B. I. ii. 254; Br. 246; G. 267; C. i. 410; Watt. ii. 3. The Fever nut. Vern. *Sagargoti* (Mar.—B. C.); *Gataran* (Hin.—Jub.; Chin.; Seo.); *Gatan* (Hin.—Sau.).

A prickly scrambling or climbing shrub, with large pointed stipules. Leaves alt., 2-pinnate. Pinnæ 6-8 pr.; leaflets 6-9 pr. ½-1 in. long. Fls. yellow, in ax. many fld. racemes. Pod, oblong, 2-3 in., covered with wiry prickles.

Fls. *Aug.-Oct.*; fr. *Dec.-Feb.*; evergreen.

Common in hedges near villages throughout the B.C. Also Jub.; Sau.; Chin.; Seo.; and probably throughout the N. C.

The seeds are largely used as a tonic and febrifuge.

214. **Cæsalpinia sepiaria**, *Roxb.* F. B. I. ii. 256; Br. 246; G. 267; C. i. 412; Watt. ii. 12. Vern. *Kirkich* (Hin.—Jub.; Chin.; S. Man.; Hosh.; Seo.); *Kirmich* (Sau.); *Chillati* (Mar.—B. C.; Chin.); *Golchuna* (Bet.).

A scrambling or climbing shrub, armed with hooked prickles. Leaves 2-pinnate, with 8-10 prs. opp. pinnæ, each with 6-12 prs. of oblong leaflets, ½-1 in. long. Fls. bright yellow, in conspicuous term. and ax. racemes 6-12 in. long. Pod 3-4 in. long, linear-oblong, with a long beak.

Fls. *Dec.-Mar.*; fr. *Mar.-June.*

Common in hedges throughout the area, and not uncommonly planted as a hedge.

The bark is used for tanning in the Konkan.

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215. **Cæsalpinia pulcherrima,** *Sw.* F. B. I. ii. 255; Br. 247; G. 268; C. i. 413; Watt. ii. 10. Vern. *Kailaia* (Mel); *Golchuna* (Bet).

A large glabrous shrub with a few scattered prickles. Leaves bi-pinnate; pinnæ 6-8 pr.; leaflets 8-12 pr. Pyramidal elongate racemes of bright yellow or scarlet fls. with long red filaments. Pod 2-3 in. long, narrow.

Fls. rains and cold season; fr. cold season.

Commonly cultivated in gardens and not infrequently running wild round villages. Jub.; Sau.; Seo.; Ni.; Mel.; Bet.; Chin.

216. **Cassia Fistula,** *Linn.* F. B. I. ii. 261; Br. 253; G. 271; C. i. 417; Watt. ii. 217. Vern. *Amaltas* (Hin.—N. C.; Ni.; Bet.); *Jagaruwa* (Gond.—Jub.; S. Man.); *Rela* (Gond.—Seo.; S. Man.); *Dhanbahar* (S. Man.); *Kerwara* (Gond.—Jub.; Dam.); *Bahawa, bahala* (Mar.—Berar); *Bhanaka-bhungru* (Kur.—Mel.). Indian Laburnam.

A small tree with smooth grey bark. Leaves paripinnate, with 4-8 pr. of ovate-oblong acute leaflets, 2-5 in. long. Handsome drooping racemes of large yellow fls. on long pedicels. Pod dark brown, cylindrical, drooping, 1-2 ft. long.

Fls. *May.-Aug.*; fr. ripens about *Dec.* but remains long on the tree; almost evergreen; leaves fall, *Apr.-May*; leaves renewed, *May-June.*

Common in all Divisions.

The wood is good and durable It is used for carts, agricultural implements and rice-pounders. The pulp of the pods is a strong purgative, and is considerably used in native medicine. The bark is used for tanning in the U. P. and S. India.

217 **Cassia occidentalis,** *Linn.* F. B. I. ii. 262; G. 271; C. i. 418; Watt. ii. 221. Vern. *Chakawra* (Sau.; Jub.; Ni.); *Chirotha* (Chin.)

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An erect fœtid herb or undershrub, 2-3 ft. high, with paripinnate leaves, and 3-5 pr. ovate-lanceolate leaflets, gradually attenuated to a very acute apex. A single large conical gland at base of rachis. Fls. yellow, in few fld., sometimes panicled racemes. Pod 4-5 in., compressed, slightly curved, distinctly torulose.

Fls. *Aug.-Oct.*; fr. *Nov.-Jan.*; annual appearing with the rains.

Abundant in waste places and round dwellings in the rains. Chin.; Jub.; Sau.; Hosh.; Ni.; Mel. and no doubt in all Divisions.

In the West Indies the seed is used as a substitute for coffee.

218. **Cassia Sophera,** *Linn.* F. B. I. ii. 262; G. 271; C. i. 419; Watt. ii. 223. Vern. *Bara chakaora* (Chin.; Ni.; Jub.); *Bara puar* (Sau.); *Bara chirotha* (Seo.); *Etikol* (Jub).

A shrub, similar to preceding, but 4-7 ft. high; leaflets 6-10 pr.; pods scarcely torulose.

Fls. *Aug.-Nov.*; fr. *Oct.-Jan.*; annual or perennial appearing in the rains and dying down about *Mar.-Apr.*

Abundant on waste ground near villages. Jub.; Sau.; Chin.; Seo.; Ni.; Mel.; and no doubt throughout the area.

The bark, leaves, and seeds are used medicinally as a cathartic, and the juice of the leaves for ringworm and skin diseases.

219. **Cassia Tora,** *Linn.* F. B. I. ii. 263; G. 271; C. i. 420; Watt. ii. 224. Vern. *Chakaora* (S. Man.; Ni.); *Tarota* (B. C.; Chin.); *Puar* (Sau.).

An erect fœtid herb, 1-3 ft. high, with 3 pr. of obovate leaflets, and a conical gland between each of the two lowest pr. of leaflets. Fls. yellow, ax., usually in pairs. Pod 4-angled, 5-8 in. long.

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Fls. *Aug.-Oct.* ; fr. *Oct.-Dec.* Annual appearing with the rains.

A very common weed of roadsides and waste places, often gregarious especially on cattle stands. Throughout the area.

The tender leaves are boiled and eaten as a pot-herb, especially in times of scarcity. Both leaves and seeds constitute a valuable remedy for skin diseases.

220. **Cassia obtusifolia,** *Linn.* F. B. I. ii. 263 ; C. i. 420. Vern. *Chakaora* (Jub. ; Chin. ; Mel.) ; *Chirotha* (Gond. —Seo. ; Dam.) ; *Puar* (Sau.).

An erect herb, not fœtid. Differs from *C. Tora* by the presence of a gland between the lowest pr. of leaflets only.

Fls. *Aug.-Oct.* ; fr. *Oct.-Dec.* Annual.

Will probably be found to be as frequent as *C. Tora.*

221. **Cassia auriculata,** *Linn.* F. B. I. ii. 263 ; Br. 254 ; G. 273 ; C. i. 421 ; Watt. ii. 215. Vern. *Tarwar* (Mar.—Berar) ; *Awli* (Ni.) ; *Tarota* (Hin.—Chin. ; Bet.).

A much branched pubescent shrub, 3-10 ft. high, with 8-12. pr. of oblong leaflets, 1 in. long. Easly recognised by the large foliaceous ear-shaped stipules. Fls. large, yellow, in ax. and term. corymbs. Pod 3-5 in. long, flat, depressed between the seeds.

Fls. *Oct.-Jan.* ; fr. *Jan.-Mar.*

Confined to the drier areas. On light sandy soil along the Nerbudda and Tapti rivers, Ni. ; Mel., at low elevations. Dry hills of Berar ; Chin. ; Am. ; Bet. Probably to be found in all the Berar Circle Divisions.

The bark is a valuable and well-known tanning material, and is extensively used in Madras. Chamars use it in Ni. The twigs are used by natives as tooth brushes.

222. **Cassia siamea,** *Lam.* F. B. I. ii. 264 ; Br. 254 ; G. 274 ; C. i. 427 ; Watt. ii. 223. Vern. *Kassondan* (Sau.).

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A middle-sized tree with paripinnate leaves and 6-14 pr. of elliptic leaflets, 1½-2½ in. long. Fls. yellow, ⅞ in large conspicuous erect panicles. Pod flat, 4-10 in. long.

Fls. *Sep.-Nov.*; fr. *Feb.-Apr.* Evergreen.

Indigenous in Burma and S. India. Very commonly planted as an avenue tree in this area. Jub.; Sau.; Ni.; Mel.; S Man.; Seo.

223. **Cassia Absus,** *Linn.* F. B. I. ii. 265; C. i. 424; Watt. ii. 210.

An erect herb clothed with viscous hairs. Paripinnate leaves, with 2 pr. of very oblique elliptic-obovate leaflets, 1 in. long. Fls. yellow or red, in short terminal racemes. Pod compressed, thin, 1½ in. long, clothed with bristly hairs.

Fls. and fr. *Aug.-Sep.* Annual appearing with the rains.

Common on waste land. Sau.; Ni.; Chin. (Ambara R.) and probably throughout the area.

The seeds are used in Sind for the treatment of ophthalmia.

224. **Cassia mimosoides,** *Linn.* F. B. I. ii. 266; C. i. 426; Watt. ii. 220.

An erect undershrub, 1-3 ft. Distinguished from the other species by the very numerous, small leaflets, 40-60 prs. Fls. yellow, ax., solitary. Pod 1½ in. long, thin, flat.

Fls. and fr. *Feb.-Oct.*

Sau. (Damoni Res.).

225. **Cassia glauca,** *Lam.* F. B. I. ii. 265; Br. 255; G. 271; C. i. 425; Watt. ii. 219.

A large shrub or small tree with spreading branches, and 4-6 pr. of pale green, elliptic-oblong leaflets, 1½-3 in. long, with a gland between each of the 2-3

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GSL

lower pr. of leaflets. Fls. yellow, in ax. corymbs. Pod thin, glabrous, 4-8 in. long.

Fls. at different seasons.

Indigenous in most parts of India, but so far only found planted in gardens in this area. Doubtfully wild, probably an escape, Sau.

226. **Hardwickia binata,** *Roxb* F. B. I ii. 270; Br. 250; G. 276; C. i. 428; Watt. iv. 200. Vern. *Anjan* (Hin., Mar.—B. C.; Hosh.; Seo.).

A large gregarious handsome tree with drooping foliage. Leaves alt. bifoliolate, the leaflets obliquely ovate, obtuse. Fls. very small, greenish-yellow, in ax. and term. panicles. Pod, strap-shaped, narrowed at both ends, the one seed at the apex.

Fls. *July-Aug.*; fr. *Feb.-Mar.*; leaves fall, *Apr.-May*; leaves renewed, *May-June*. It is therefore almost evergreen and in localities where it is frequent it is often the only green tree in the landscape.

Although gregarious it is very local in its occurrence. Its principal habitats are the hills of Bul. and Ni. It is also found in Ak.; Mel.; Hosh.; Seo. and one small area in Bet.

It occurs commonly both on trap and sandstone formations, but it is on the granite and limestone formations along the Nerbudda in Ni. that it attains to its best development, trees of 60 ft. in height, and 7 and 8 ft. girth not being uncommon.

The dark red heartwood is very hard and heavy, and is used for bridges and house-posts, also for oil-mill crushers, naves of cart wheels, and ploughs. It is extensively pollarded for cattle fodder, and in the past much damage has been done to the tree in the reserves on this account. The leaves are eaten in famine time.

227. **Tamarindus indica,** *Linn.* F. B. I. ii. 273; Br. 252; G. 278; C. i. 429; Watt. vi. pt. iii, 404. The Tamarind

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tree. Vern. *Imli* (Hin.—N. C.; Ni.; Bet.); *Chia* (Gond.—Seo.; Jub.); *Chinch* (Mar.—Berar); *Chicha* (Kur.—Mel.).

A large spreading tree with alt. paripinnate leaves, and 10-20 prs. of small close leaflets ½ in long. Fls. small, variegated red and yellow, in lax racemes, Pod 3-6 in. long, thick, slightly curved, filled with dark brown acid pulp.

Fls. *Apr.-June*; fr. ripens following *Feb.-Apr.*; evergreen.

Cultivated throughout the area, and self sown on deserted village sites in forest.

The wood is hard and highly prized, but the tree is seldom felled. The wood is used for wheels, oil and sugar mills, and furniture. The acid pulp in the pod is a laxative and is used medicinally. Poultices of the leaves are used for inflammatory swellings.

228. **Bauhinia tomentosa,** *Linn.* F. B. I. ii. 275; Br. 256; G. 281; C. i. 431; Watt. i. 423. Vern. *Champa* (Sau.)

An erect shrub or small tree. Leaves alt. 2-3 in. long, nearly as broad as long, divided ⅓ way down into two obtuse lobes, 7-9 nerved from the base. Fls. pale yellow, in pairs, on ax. or leaf opposed peduncles. Pod 4-5 in. long, thin, pubescent.

Fls. *July-Aug.*; fr. *Sep.-Oct.*; leaves fall, *Feb.-Mar.*; leaves renewed, *Apr.*

Rare. Only found in Rangir Res., Sau., and only over a small area, but undoubtedly wild. The locality is known as 'Champaghat' on account of the tree.

229. **Bauhinia racemosa,** *Lam.* F. B. I. ii 276; Br. 256; G. 281; C. i. 431; Watt. i. 422. Vern. *Ashto* (Hin.—Jub.; Sau.; Chin; Seo.; Dam.; Hosh.); *Mohala, daurera* (Hin.—Jub.); *Dhondera* (Gond.—Seo.); *Dhondri* (Gond.—Jub.); *Bhosa, apta* (Mar.—

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Berar ; Chin.) ; *Abeta*, *apta* (Ni.) ; *Kateri* (S. Man.) ; *Bhosai* (Kur.—Mel.).

A small usually crooked tree. Leaves 1-2½ in. long, broader than long, divided about ¼ way down into 2 rounded lobes. Fls. small white, in racemes 2-4 in. long. Pod 4-7 in. long, thick, curved, not conspicuously veined.

Fls. *Apr.-June ;* fr. ripens *Nov.-Jan.* but remains long on the tree; leaves fall, *Mar.-Apr. ;* leaves renewed, *Apr.-June.*

Common in all Divisions, more especially in dry localities.

The wood is not used except for fuel. The inner bark yields a strong fibre.

230. **Bauhinia malabarica,** *Roxb.* F. B. I. ii. 277 ; Br. 256 ; G. 282 ; C. i. 432 ; Watt. i. 420. Vern. *Amta* (Hin.—Jub. ; Seo. ; Chin. ; Mel. ; Hosh.) ; *Amti* (S. Man.) ; *Khatua* (Sau. ; Ni. ; Bet.); *Asthura* (Am. ; Ni. ; Bet.) ; *Amboti* (Mar.—Am.) ; *Ambotha* (Kur.—Mel.).

A small tree. Leaves 2-3 in. long, broader than long, divided less than ¼ way down, sometimes barely lobed. Fls. white, in ax. corymbose racemes. Pod 10-12 in. long, conspicuously marked with raised wavy lines descending from the middle to the edges of the pod.

Fls. *Sep.-Nov. ;* fr. *Dec.-Feb.* Evergreen.

Fairly common but in moister situations than the preceding species. Probably in all Divisions, but so far not reported from Yeo. ; Bul. ; Ak. and Dam.

The leaves have an acid taste and are eaten. The wood is not used except for fuel.

231. **Bauhinia retusa,** *Ham.* F. B. I. ii. 279 ; Br. 257 ; G. 282 ; Watt. i. 423. Vern. *Thaur* (Gond.—Chin. ; S. Man. ; Hosh.) ; *Kat mohala* (Dindori R., S. Man.).

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A small tree with grey bark. Leaves broader than long, 4-7 in. across, not lobed or only emarginate; basal nerves 7-11. Fls. white, in large term. panicles. Pod 4-6 in. long, broadest at the apex.

Fls. *Sep.-Dec.*; fr. *Feb.-Mar.*; evergreen.
Not common. Chiefly in valleys. S. Man. (Karanjia); N. Man (Dhanwahi R.); Seo.; Chin.; Hosh.

Yields a gum very similar to gum arabic, which is used medicinally in the U. P.

232. **Bauhinia Vahlii**, *W. and A.* F. B. I. ii. 279; Br. 258; G. 283; C. i. 433; Watt. i. 424. Vern. *Mahul* (Hin., Mar.—N. C.; B. C.); *Mohlein, mohalain* (S. Man.; Jub.; Seo.); *Maula* (Ni.; Mel.); *Paur bela* (Gond.—Seo.; Jub.).

A large climber, stems up to 3 ft. girth. Leaves large as broad as long, 4-12 in. across, divided ⅓ way down into 2 obtuse lobes; basal nerves 11-15. Fls. creamy white, in term. corymbs. Pod flat, woody, 6-12 in. long.

Fls. *Apr.-June*; fr. *Dec.-Mar.*; almost evergreen; leaves renewed, *May*.

Common in all Divisions in the better class forests, on hillsides and in valleys. Not in open scrub jungle.

An exceedingly destructive climber, and difficult to eradicate. The leaves are used as plates, and to make rain caps; rope is made from the bark; the seeds are roasted and eaten.

233. **Bauhinia purpurea**, *Linn.* F. B. I. ii. 284; Br. 258; G. 283; C. i. 433; Watt. i. 421. Vern. *Keolar* (Hin.—Chin.; Sau.; Jub.; Dam.; Seo.; Hosh.); *Keolari* (Mel.); *Koilar* (S. Man.); *Kudwari* (Gond.—Seo.); *Koilari kachnar* (?), *kanchan* (Berar); *Dundra* (Jub.).

A small tree. Leaves about as broad as long, 4-5 in. across, divided from ⅓ to ½ way down into two lobes

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with almost angular tips; basal nerves 9-11. Fls. rose-purple, in term. and ax. panicled racemes. Pod 6-12 in. long, flat, thickish, green, somewhat splashed with red when young.

Fls. *Sep.-Nov.*; fr. *Jan.-Mar.*; almost evergreen; leaves renewed, *May-June*.

Throughout the area, scattered, but nowhere very common.

The flowers and leaves are eaten in curries. The bark is astringent. The wood is not used in this area.

234. **Bauhinia variegata,** *Linn.* F. B. I. ii. 284; Br. 258; G. 284; C. i. 434; Watt i. 425. Vern. *Kachnar* (Hin.—N.C.; Ni.); *Kanchan, kachnag* (Mar.—B. C.); *Champa* (Kur.—Mel.); *Mohala* (Gond.—Seo.; Jub.).

A small tree. Leaves slightly broader than long, 3″-6″ across, divided ⅓ of the way down or less into two rounded lobes. Fls. large, fragrant, pure white or light purple (1 petal darker than the rest, and variegated with yellow). Pod 9″-12″ long, flat, thin, with splashes of red or purple on it when still green.

Fls. *Feb.-Apr.*; fr. *Apr.-May*; leaves fall, *Feb.*, but lower portion of tree below flowering branches usually retains some foliage; leaves renewed, *Apr.-May*.

In hilly localities. In all Divisions of the N. C., also Am.; Ak.; Ni.; Bet; plentiful in the Mel. Commonly planted as a road-side tree, Sau.

Not used in this area. The tree yields a gum known as Semla gond. The bark is used for dyeing and tanning in Bombay and Madras.

The following non-indigenous species belonging to this sub-order are cultivated :—

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235. **Poinciana elata.** *Linn.* F.B.I. ii. 260; Br. 249; C. i. 414; Watt vi. pt. i. 309. Vern. *Waykaran* (Ni.).

A small tree with 2-pinnate leaves, and yellowish-white fls. in corymbose racemes. Planted in Berar Near Burhanpur, Ni., probably introduced by the Mahomedans. Said to have been introduced from Abyssinia.

236. **Poinciana regia.** *Bojer.* F. B. I. ii. 260; Br. 249; G. 270; C. i. 415; Watt vi. pt. i, 309. The Gold Mohur tree. Vern. *Gulmohur.*

This tree with its gorgeous scarlet fls. is much planted in gardens. It is a native of Madagascar. Fls. *Apr.-June* when leafless.

237. **Parkinsonia aculeata,** *Linn.* F. B. I. ii. 260; Br 249; G. 270; C. i. 415; Watt vi. pt. i, 110. Vern. *Vilayati babul.*

A small tree, with sharp woody spines, and apparently flat green branchlets without any leaves. This curious appearance is due to the flat raches with minute inconspicuous leaflets. Fls. showy, yellow.

Frequently cultivated as a hedge plant in Berar. A native of tropical America.

238. **Cassia marginata,** *Roxb.* F. B. I. ii. 262; Br. 253; G. 273; C. i. 426; Watt. ii. 220.

A small tree, with pinnate leaves, 10-15 pr. leaflets, and pink fls. in ax. racemes. Occasionally planted in gardens. Fls. *Aug.-Sep.* It is indigenous in S. India.

239. **Saraca indica,** *Linn.* F. B. I. ii. 271; Br. 250; G. 278; C. i. 429; Watt vi. pt. ii, 475. Vern. *Asok* (Hin.).

An evergreen tree with paripinnate leaves and orange scarlet fls. in dense corymbs. Cultivated in gardens. Indigenous in E Bengal, Burma and W. Peninsula.

III.—MIMOSEÆ.

240. **Prosopis spicigera,** *Linn.* F. B. I. ii. 288; Br. 260; G 288; C. i. 439; Watt v. pt. i, 340. Vern. *Saundar* (Mar.—Mel.; Yeo.; Am.; Bul.; Ni.); *Saundal, shami* (Am.).

A medium sized thorny tree with bluish-green foliage. Leaves alt. bi-pinnate, pinnæ 2 pr.; leaflets 7-10 pr.

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Fls. minute, yellow, in ax. spikes 2-3 in. long. Pod 4-8 in. long, cylindric, contracted between the seeds.

Fls. *Feb.-Apr.*; leaves fall, *Dec.-Jan.*; leaves renewed, *Jan.-Feb.*

Only in the very driest portions of the area. Am.; Bul.; Ni. (Punasa R.); Yeo.; Mel. This tree develops an exceedingly long taproot which enables it to thrive in the most arid regions.

It is largely used for fuel in the Punjab. The pods which contain a farinaceous pulp are eaten. They are also used as fodder for camels and goats.

241. **Dichrostachys cinerea,** *W. et A.* F. B. I. ii. 288; Br. 261; G. 288; C. i. 440; Watt iii. 109. Vern. *Yelatri, yelati* (Mar.—B.C.); *Bilatri, murmiar* (Ni.).

A small thorny tree with light grey bark. Leaves bi-pinnate; pinnæ 6-10 pr.; leaflets minute, linear, 12-20 pr. Fls. in tassel-like ax. spikes, the upper half yellow, the lower half of imperfect rose coloured or white fls. Pod irregularly curled and twisted.

Fls. *Sep.-Nov.*; fr. *Oct.-Dec.*

Common on black cotton soil, often forming gregarious thickets. Throughout the B. C. but so far only obtained in Chin. in the N. C.; Ni. (Chandgarh R., Punasa R.).

The wood yields a good fuel.

242. **Mimosa rubicaulis,** *Lam.* F. B. I. ii. 291; Br. 263; G. 290; C. i. 442; Watt v. 249. Vern. *Ail* (Hin.—Jub.; Seo.; Ni.); *Ar* (Hin.—Sau.; Ni.); *Sustol* (Gond.—Seo.); *Chilati* (Mar.—B. C.; Chin.).

A weak straggling prickly shrub, 6-12 ft., with many branches from the root. Leaves bi-pinnate; pinnæ 6-12 pr.; leaflets small, 8-20 pr. Fls. pink, in globose heads, panicled at the ends of the branches. Pod flat,

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slightly curved, separating in square joints from the frame.

Fls. *July-Sep.*; fr. *Nov. Jan.*; leaves fall, *Jan.-Feb.*; leaves renewed, *June* The branches frequently die down in the hot season.

Common throughout the B. C. especially on abandoned cultivation, and grass lands. Also in Jub.; Sau.; Dam.; Chin.

A variety with the pod armed with hooked prickles (*M. spinosisiliqua*, Rottler.), is common in the Mel.

The root, fr. and leaves are used medicinally in Chota Nagpur.

243. **Mimosa hamata,** *Willd.* F. B. I. ii. 291; Br. 263; G. 290; C. i. 442. Vern. *Chilati* (Mar.—B. C.); *Ail* (Ni).

A much branched shrub. Strongly resembles the preceding but it has fewer pinnæ, usually only 2-4 pr., also fewer leaflets, while the pod is shorter, more curved, somewhat grey-pubescent, and the frame always armed with numerous hooked prickles.

Fls. *July-Sep.*; fr. *Nov.-Jan.*

Apparently not so common in the B. C. as *M. rubicaulis.* Found in Ni.; Mel. Donald is of opinion that this species is not found in Berar, but that the variety *M. spinosisiliqua* has been mistaken for it I have not found it in the N. C.

244. **Mimosa pudica,** *Linn.* F B I. ii. 291; Br. 263; G. 290; C. i. 441; Watt v. 248. The Sensitive Plant. Vern *Tajoni* (Berar); *Geoghara* (Kur.—Mel.); *Lajalu* (Mar.—Am.); *Lajni* (Seo.; Sau.).

A diffuse undershrub, clothed with long bristly hairs. Leaves bi-pinnate; pinnæ 2-4, digitate; leaflets 12-20 pr. Easily recognised by the habit of the leaves which close up when touched. Fls. pink, in globose

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heads in ax. pairs. Pod ½-¾ in. long, clothed with weak yellowish bristles.

Fls. *Sep.-Oct.* ; fr. *Nov.-Dec.*

Not uncommon on waste land. Ni. ; Mel. ; S. Man. ; Am. ; Seo. ; Sau. and probably in all Divisions.

It is said to have been introduced from Tropical America.

The root and leaves are used medicinally in Bombay and elsewhere.

The Acacias are all prickly shrubs or trees with bi-pinnate leaves and are distinguished from Mimosa by the pod not breaking up into joints.

245. **Acacia Farnesiana,** *Willd.* F. B. I. ii. 292 ; Br. 263 ; G. 292 ; C. i. 445 ; Watt i. 48. Vern. *Vilayati babul* (Hin.—Ni. ; Berar) ; *Gandila babul* (Dam. ; Sau. ; Chin. ; Seo. ; Hosh.) ; *Gandharri, gandila bamura* (Jub.) ; *Katangi babul* (S. Man.).

A large shrub. Leaves alt. 2-pinnate ; pinnæ 4-8 pr. with 10-20 pr. of minute leaflets. Fls. sweet-scented, in bright yellow globose heads. Pod nearly cylindric, slightly curved, 2-3 in. long.

Fls. *Nov.-Feb.* ; fr. *Feb.-June.* Evergreen.

Naturalised and semi-wild throughout the area. Frequently planted near villages and commonly found on black cotton soil near nalas. Indigenous in America.

The fl. heads are extensively used in European perfumery, though hardly if at all in India. A gum from the trunk is collected and used in Sind.

246. **Acacia arabica,** *Willd.* F. B. I. ii. 293 ; Br. 264 ; G. 292 ; C. i. 443 ; Watt i. 18. Vern. *Babul* (Hin., Mar. —N. C. ; B. C.) ; *Bamura* (Gond.—Jub. ; Seo. ; Dam.).

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A middle sized tree with deeply cracked black bark. Leaves 2-pinnate; pinnæ 3-6 pr with 10-20 pr. leaflets. Fls. golden-yellow, in globose heads in ax. fascicles. Pod 3-6 in. long, deeply constricted between the seeds, whitish tomentose.

Fls. *Aug.-Dec.*; fr. ripens *Apr.-May*. Evergreen, new foliage from *Feb.-Apr.*

Throughout the area, especially affecting black cotton soil. A very important and valuable species in Berar, where it forms gregarious forests known as "babul bans." There are three well known varieties of Babul—(1) *Telia babul* with blackish-brown bark, only slightly cracked, and short thorns; (2) *Kaoria babul* with deeply cracked grey-brown bark and long thorns; (3) *Ramkanta babul*, the branches growing out at an acute angle like a cypress tree. The timber of (1) is highly prized, while that of (2) is considered only fit for fuel.

The bark, and to a less extent the pods, are used for dyeing and tanning. The unripe green pods as well as the leaves are given as fodder to sheep, goats, and camels. In Sind and Guzerat lac is extensively cultivated on this species. The timber is largely used in the construction of cart wheels, oil-presses, and agricultural implements. It makes an excellent fuel.

247. **Acacia eburnea,** *Willd.* F. B. I. ii. 293; Br 264; G. 294; C. i. 445; Watt i. 48. Vern. *Marmati* (Mar.—B. C.); *Beha bamura* (Hosh.).

A small tree armed with long ivory white spines. Young parts densely hairy. Leaves 2-pinnate; pinnæ 4-8 pr. with 8-12 pr. leaflets. Fls. with an unpleasant smell, bright-yellow, in globose heads, numerous, along the young branches. Pod only slightly constricted between the seeds.

Fls. *Dec.-Feb.*; fr. *Mar.-May*.

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Confined to the drier areas. Common in the B. C. except Bet.; Ni. (Sukwa Rès.); Kesla, Hosh. (a single large shrub in hedge).

The wood is of no value.

248. **Acacia Jacquemontii,** *Benth.* F. B. I. ii. 293; Br. 265; G. 294; C. i 446; Watt i. 51. Vern. *Marmati* (Mar.).

A bushy shrub, very similar to preceding, but always quite glabrous; pinnæ 2-4 pr. Fl. heads yellow, sweet-scented. Pod 2-3 in. long, straight, flat, grey.

Fls. *Feb. Apr.*

Rare. Near Ghatang, Mel. On rocks by the Nerbudda, near Chandgarh, Ni.—(Duthie).

The bark is used for tanning in Rajputana.

249. **Acacia leucophlœa,** *Willd.* F. B. I. ii 294; Br. 265; G. 295; C i. 447; Watt i. 52. Vern. *Reung, reunjha* (Hin.—N. C.; Ni; Bet.); *Hiwar* (Mar.—B. C.; Chin.; Seo.); *Rinjra* (Kur.—Mel.).

A middle sized tree with yellowish brown bark. Pinnæ 5-15 pr.; leaflets 12-25 pr., grey-green, linear, pubescent. Fl. heads yellowish-white, in large term. leafless tomentose panicles. Pod 4-6 in. long, thin, flat, clothed with dense brown velvety pubescence.

Fls. *Aug Oct*; fr. *Dec.-Apr.*; leaves fall, *Mar.-Apr.*; leaves renewed, *May -June.*

Common almost throughout the area especially on black cotton soil. Scarce in S. Man.

The wood is strong and tough and seasons well, but is little used, except for fuel. The bark yields a coarse fibre, suitable for fishing nets and ropes. The fr. is collected for fodder in the Punjab.

250. **Acacia Catechu,** *Willd.* F. B. I. ii. 295; Br. 267; G. 296; C. i. 448; Watt i. 27. Vern. *Khair* (Hin. Mar.—N. C.; B. C.).

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A small tree in this area. Pinnæ 10-20 pr.; leaflets 30-50 pr., linear, less than ¼ in. long Fls. pale yellow, in cylindrical ax. spikes. Pod thin, brown, shining, dehiscent.

Fls. *June-Aug.*; fr. *Dec.-Feb.*, the pods remaining long on the tree; leaves fall, *Jan.-Feb*; leaves renewed, *June*.

Common throughout the area, sometimes gregarious on dry shallow rocky soil.

A valuable tree. The dark red heartwood is extremely durable and seasons well. It is used for pestles, oil crushers, agricultural implements and cart wheels. Catechu, Cutch, 'katha' is extracted from the heartwood by boiling and is used for dyeing purposes and chewing with betel. It constitutes an important item of minor forest produce in the N. C., in Sau., Dam., Jub., S Man. It is extensively exported to Europe from many parts of India.

251. **Acacia ferruginea**, *D. C.* F. B. I. ii. 295; Br. 266; G. 298; C. i. 448; Watt i. 50. Vern. *Safed khair, son khair, pandhara khair* (Mar.—B. C.); *Khair bora* (Ni.).

A large tree, with rough, dark coloured bark. Pinnæ 4-6 pr., at once distinguishing it from *A. Catechu* which it somewhat resembles. Leaflets 15-30 pr., linear, ¼-½ in. long. Fls. in pale yellow ax. spikes, panicled at the ends of branches. Pod 3-4 in. long by ¾ in., dark brown, glabrous, veined, upper suture narrowly winged.

Fls. *Jan.-Feb.*; fr. ripens following *Nov.-Dec.*

Scattered. Usually on black soil, and mainly in the Western Divisions. On the Tapti river, Mel.; Ni. (Punasa Res., Takli Res.); Yeo.; Bul.; Seo.

The wood is used for building, carts, and agricultural implements.

252. **Acacia, lenticularis**, *Ham.* F. B. I. ii. 296; Br. 266; G. 299; Watt i. 52. Vern. *Bara khair* (Hin.—Jub.;

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Mel.; Seo.); *Gar khair* (Jub.; S. Man.; Seo.); *Jhar khair* (S. Man.).

A small tree with stout recurved prickles, sometimes wanting Pinnæ 2-4 pr.; leaflets 6-12 pr., oblong, obtuse, glaucous, 1 in. long. Fls. yellow in ax. spikes 3-5 in. long. Pod 6-9 in. long by 1 in., sutures thickened.

Fls. *May-June*; fr. *Nov.-Jan.*

Not very frequent, confined to hilly localities. Mel. (Gugamal R.); Jub.; S. Man.; Seo.

The wood is hard and strong.

253. **Acacia concinna,** *D. C.* F. B. I. ii. 296; Br. 269; G. 291; C. i. 450; Watt i. 44. Vern. *Sikakai* (Mar.—Bet.; Sau.).

A woody climber with scattered prickles. Pinnæ 4-6 pr.; leaflets 12-20 pr., linear, ⅓-½ in long, unequal sided. Fls. yellow, heads in dense panicles at the ends of branches. Pod thick, fleshy, becoming wrinkled when dry.

Fls. *Mar.-May*; fr. *Dec.-Feb.*; flowering branches leafless.

Not uncommon in hedges, usually near villages. Jub.; Sau.; Bet.; Mel.; and probably in other Divisions.

An infusion of the pods is used as a hairwash. The pods are also used in native medicine.

254. **Acacia caesia,** *W. et A.* F. B. I. ii. 297; Br. 268; G. 300; C. i. 451. Vern. *Gurar* (Jub.; Chin.); *Ar* (Dam.); *Karel, narisa* (S. Man); *Arail* (Ni.); *Chilati* (Mariampur, Mel.).

A large scrambling climber with numerous hooked prickles; stems channelled. Pinnæ 6-16 pr.; rachis pubescent; leaflets 10-30 pr., pubescent beneath,

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about ½ in. long, not overlapping. Basal portion of rachis bare of pinnæ for a length of 2 in. with a large raised gland close to the base, and smaller glands between the 2-8 uppermost pinnæ. Fl. heads yellowish-white, in term. panicles. Pod, thin, flat, brown, with strong sutures, clothed with a rusty tomentum when young.

Fls. *June.-Aug.* ; fr. *Jan.-Mar.* ; evergreen ; leaves renewed, *Mar.*

Fairly common, chiefly in open dry localities on sandstone. Jub. ; Chin. ; Dam. ; Ni. (Asirgarh) ; S. Man. (Gugamal R.) ; Mel. and probably in other Divisions.

255. **Acacia pennata.** *Willd.* F. B. I. ii. 297 ; Br. 269 ; G. 300 ; C. i. 451 ; Watt i. 54. Vern. *Raona* (Sau. ; Dam.) ; *Ar, ail* (Dam.) ; *Chilati* (Mar.—Mel. ; Chin.) ; *Choudaria arail* (Ni.).

A large scrambling climber with numerous hooked prickles. Branches more or less 5-angled. Resembles preceding but may be easily distinguished (1) by the smaller and more numerous leaflets, which overlap (⅛-⅓ in. long, 20-40 in number) ; (2) by the raised gland being half way between the base of the leaf stalk and the first pr. of pinnæ ; (3) rachis glabrous ; (4) the pod is dark purple to black, and shining, never tomentose when young.

Fls. *June-Aug.* ; fr. ripens, *Jan.-Apr.* ; leaves fall, *Feb.* ; leaves renewed, *May-June.*

Extremely common in hedges, and along ravines and nalas, Sau. ; Ni. Also Dam. ; Jub. ; S. Man. (Banjar Valley) ; Mel. ; Chin., and probably in all Divisions. Appears to be much commoner in this area than preceding.

256. **Acacia sp.**, *Nov.* (Acacia Donaldi of Haines in Ind. Forester, Vol. XL, p. 224). Vern. *Ailah* (Sau.); *Ramna* (Jub.).

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A small tree with somewhat straggly branches, very rarely scandent—(Haines). Prickles not so numerous as in the two preceding species. Pinnæ 10-20 pr. extending to within ½ in. of the base of rachis, with a small gland immediately above the swollen base of the petiole, and between the 3-4 uppermost pinnæ. Leaflets 20-40 pr., $\frac{1}{8}$-$\frac{1}{5}$ in. long. Pod somewhat turgid, sutures not conspicuously developed, shining, green when young, reddish to pinkish-brown when ripe.

Fls. *June-Aug* ; fr. ripens, *Dec.-Feb.* ; leaves fall, *Jan.-Feb.* ; leaves renewed, *June.*

On sandstone in very dry scrub jungle and on shallow soil, Sau. (Mohli Res., Baleh Res.). On sandstone and laterite formations, Jub.

This species has so far been considered merely as a variety of *A. pennata*. Specimens collected by Mr. R. S. Hole in Jub. in 1901 are so named in the Calcutta Herbarium. It has been found independently by Donald in Chanda and by myself in Sau. In both cases it was found as a small tree with no appearance of being a climber. It is so very different in the field from typical *pennata* that I agree with Haines that it deserves to be made into a species. I drew the attention of Mr. Calder of the Calcutta Herbarium to Hole's specimens and also supplied fresh specimens and he agrees that they are not typical *pennata* and deserve the rank of a new species. It appears to come very near to var. *canescens*, Grah., both in the colour of the pod and the position of the gland on the rachis. A specimen from Burma of this var. specially notes that it is a tree not a climber.

257. **Albizzia Lebbek**, *Benth.* F. B. I. ii. 298 ; Br. 271 ; G. 303 ; C. i. 452 ; Watt i. 156 ; Vern. *Siris* (Hin.—N. C. ; Ni.) ; *Chichola* (Mar.—Seo. ; Jub. ; Am. ; Bet. ; Mel.) ; *Kinhi* (Am. ; Yeo. ; Bul.).

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A large tree with blackish rough bark. Leaves 2-pinnate. Pinnæ 2-3 pr.; leaflets 6-8 pr., 1-1½ in. long, over ½ in. broad, obliquely oblong. Fls. white, fragrant, in globose heads on 2-3 in. long peduncles, in fascicles of 2-4 from the upper axils. Pod 8-12 in. long by 1-2 in. broad, thin, straw-coloured.

Fls. *Apr.-June*; fr. ripens *Dec.* and remains on the tree until *Apr.-May*; leaves fall, *Feb.-Mar.*; leaves renewed, *Apr.-June*.

Doubtfully wild in much of this area, but very commonly planted as a roadside tree, in all Divisions. Wild in Jallandhar Res., Baleh Res., Rangir Res., Sau.

The dark brown heartwood is durable and seasons well. It is used for sugar-cane crushers, oil-mills, furniture and wheel-work. On the European market it is known as East Indian Walnut and is highly valued. Often cultivated as a fodder plant in Mysore.

258. **Albizzia odoratissima,** *Benth.* F. B. I. ii. 299; Br. 271; G. 304; C. i. 452; Watt i. 158. Vern. *Erma* (Hin.—Jub.; Sau.; Dam.; Seo.); *Bansa* (Hin.—Dam.; Jub.; S. Man.); *Chichwa* (Mar., Gond.—Jub.; Chin.; Mel.; Seo.); *Sirsa* (Ni.); *Chichalda*, *chichonda* (Bul.; Yeo.; Ak.; Mel.); *Siris*, *kala siris* (Berar; Chin.).

A small or middle sized tree with dark grey bark, with numerous irregular horizontal cracks. Pinnæ 2-5 pr.; leaflets 6-24 pr., dark green, pubescent, ¾-1 in. long, less than ½ in. broad. Fl. heads pale yellow, fragrant, arranged in large term. panicles. Pod purplish-green (unripe), red-brown nearly glabrous when ripe, 6-8 in. long, 1 in. broad.

Fls. *Apr.-June*; fr. *Nov.-Apr.*; leaves fall, *Feb.*; leaves renewed, *Apr.-May*, with the fls.

Common throughout the area, chiefly in hill forests.

The wood seasons and polishes well, and is fairly durable. It is used for wheels, oil-mills and furniture. The leaves and twigs are lopped for cattle fodder.

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259. **Albizzia procera,** *Benth.* F. B. I. ii. 299; Br. 271; G. 305; C. i. 453; Watt i. 159. Vern. *Gúrar* (Hin.—N.C.; Ni.; Bet.); *Kiranji* (Gond.—Jub.; Seo.); *Kiranji* (Baigas—S. Man.); *Kinhi* (Mar.—Yeo.; Mel.); *Safed siris* (Hin.—B. C.).

A large tree, with smooth yellowish or greenish-white bark. Pinnæ 3-5 pr.; leaflets 6-10 pr., obliquely oblong-ovate 1-2 in. long, ½-1 in. broad. Inflorescence similar to preceding. Pod 4-8 in. long, ½-1 in. broad, pale brown, shining.

Fls. *July-Sep.*; fr. *Dec.-May*; leaves fall, *Feb.-Mar.*; leaves renewed, *Apr.-May.*

Commonly met with along streams throughout the area.

A valuable timber with brown heartwood, which is durable and seasons well. It is used for sugar-cane crushers, rice-pounders, wheels, agricultural implements and construction. The tree yields a gum but of no special value

260. **Albizzia amara,** *Boivin.* F. B. I. ii. 301; Br. 272; G. 307; C. i. 454; Watt i. 155. Vern. *Kaitha* (Ni.).

A small much branched tree with smooth dark brown bark. Pinnæ 6-15 pr.; leaflets 15-24 pr., small, linear, at once distinguishing it from the three preceding *Albizzias.* Fls. yellow, fragrant, in peduncled heads of 2-4 in the axils of the upper leaves. Pod 4-6 in. long, reddish-brown.

Fls. *Apr.-May.*

Scarce. Ni. (Punasa R., Kherighat).

The wood is hard and durable and is used in S. India for carts, ploughs and construction. The leaves are used for washing the hair.

The following non-indigenous species are commonly cultivated :—

261. **Leucæna glauca.** *Benth.* F. B. I. ii. 290; Br. 262; C. i. 440; Watt iv. 632.

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A low unarmed tree. Leaves with 4-8 pr. of pinnæ and 20-30 linear leaflets, ½ in. long. Fls. white, in globose heads. Pod 5-7 in. long, linear, flat, many seeded.

Commonly planted in gardens; as an escape, Chikalda, Mel. A native of America.

262. **Pithecolobium dulce**, *Benth.* F. B. I. ii. 302; Br. 273; C. i. 456; Watt vi. pt. i, 281.

A small tree armed with short stipular thorns. Leaves with 1 pr. of oblique leaflets. Fls. white, in small heads. Pod irregularly twisted.

Fls. *Mar.-Apr.*

A native of Mexico. Introduced and extensively planted as a hedge.

ROSACEÆ.

The following species are occasionally cultivated :—

263. **Prunus persica**, *Benth.* F. B. I. ii. 313; Br. 279. G. 312. Vern. *Aru* (Hin.). The Peach.

Cultivated in gardens for its fruit.

264. **Eriobotrya japonica**, *Lindl.* F. B. I. ii. 372; Br. 290; G. 321; C. i. 462. The Loquat, a Chinese fruit. Cultivated in gardens.

265. **Rosa involucrata**, *Roxb.* F. B. I. ii. 365; Br. 287; G. 318.

An erect or climbing shrub, with large white fls. Cultivated in gardens.

COMBRETACEÆ.

266. **Terminalia belerica**, *Roxb.* F. B. I. ii. 445; Br. 307; G. 337; C. i. 478; Watt vi. pt. iv, 18. Vern. *Bahera*, *behera* (Hin., Mar.—N.C.; B.C.); *Tahaka* (Gond. —Jub.; Seo.); *Bohedá* (Am.).

A large tree with bluish-grey bark and straight clean stem. Leaves simple, alt., obovate-elliptic, glabrous, 4-9 in. long, the sec. nerves very conspicuous. Fls. small greenish-white, with a strong honey smell, in spikes 4-6 in. long. Fr. ovoid, grey, velvety, 1 in. long.

Fls. *Apr.-May*; fr. following *Jan.-Apr.*; leaves fall, *Feb.-Mar.*; leaves renewed, *Apr.-May*.

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Throughout the area in the moister forests.

The wood is not very durable, but is used to a certain extent for ploughs and carts, and in the U. P. for house building. The fruit is of little commercial value. The seeds are used medicinally.

267. **Terminalia Chebula,** *Retz.* F. B. I. ii. 446; Br. 308; G. 338; C. i. 478; Watt vi. pt. iv, 24. Vern. *Harra* (Hin.—N. C.; Ni.; Bet.); *Mahoka* (Gond.—Jub.; Seo.); *Hilda, hirda* (Mar.—Mel.; Ak.).

A small or middle sized tree, the bark much cracked and furrowed. Leaves alt. or sub-opposite, eiliptic-oblong 3-8 in. long Fls. whitish, in spikes from the upper axils, and in small term. panicles. Fr. ellipsoid or obovoid, 5-ribbed when dry, 1-1½ in. long

Fls. *Apr.-May,* and also *July-Aug.*; fr. *Nov.-Feb.*; leaves fall, *Feb.-Mar.*; leaves renewed, *Apr.*

Confined for the most part to the higher plateaux, in open forest. Very unevenly distributed. Commonly found on a yellow soil overlying laterite, sandstone and metamorphic rocks. Most frequent on the high plateaux of S. Man. Also in Jub.; Seo.; Chin.; Hosh.; Dam.; Sau. (Rehli and Deori R.); Mel.; Ak.; Bet.; Ni.

The wood is fairly durable, but is not used in this area, the tree being reserved for the fruit which supplies the myrobalan of commerce, one of the most valuable Indian dyeing materials, and largely exported from Bombay to Europe.

268. **Terminalia Arjuna,** *Bedd.* F. B. I. ii. 447; Br. 311; G. 341; C. i. 479; Watt vi. pt. iv, 16. Vern. *Koha* (Hin.—N. C.); *Kahu* (Hin.—B. C.; Chin.); *Kowa* (Mel.); *Mangi* (Gond.—Jub.; Seo.); *Anjan* (Mar.—Yeo.; Am.).

A large tree with buttressed trunk and smooth grey bark. Leaves sub-opp. coriaceous, oblong, 3-6 in. long. Fls. dull yellow in panicled spikes. Fr. 1 in. long with 5-7 narrow wings.

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Fls. *Apr.-June;* fr. ripens following *Feb.-Apr.;* in damp places evergreen, elsewhere leaves fall *Mar.-Apr.;* leaves renewed, *Apr.-May.*

Common along the banks of streams in every Division. Frequently planted as a road-side tree. On account of its habitat along streams it is seldom felled.

The wood is not of much use, being apt to split in seasoning. The bark is used locally for tanning and much damage is done in Ni. by the removal of the bark by Chamars.

269. **Terminalia tomentosa,** *W. et Arn.* F. B. I. ii. 447; Br 310; G. 341; C. i. 479; Watt vi. pt. iv, 37. Vern. *Saj* (Hin.—N. C.; Ni.; Bet.) *Mard* (Gond.—Jub); *Ain* (Mar.—Yeo.; Am.); *Ain, sadora, sadra* (Berar); *Sadar, athna* (Mel.).

A large tree on good soil, with deeply cracked black bark. Leaves, almost opp. coriaceous, elliptic, or ell.-obovate, pubescent beneath, 5-9 in. long. Fls. small, greenish-white in erect term. panicled spikes. Fr. brown, 1½-2 in. long, 5-winged.

Fls. *June-July;* fr. ripens following *Feb.-Mar.;* leaves fall, *Feb.-Mar;* leaves renewed, *June.*

Common throughout the area on all soils and situations. In deep valleys on heavy black soil it reaches large dimensions.

It is not highly valued as timber, and seldom used if teak can be obtained. The poorer classes use it for house building. It is however extensively used for fuel, and for making charcoal. The bark yields a tanning material. The tassar silk-worm is feed on the leaves.

270. **Anogeissus latifolia,** *Wall.* F. B. I. ii. 450; Br. 315; G. 346; C. i. 482; Watt. i. 256. Vern. *Dhawa, dhaura* (Hin.—N. C.; Ni.; Bet.); *Dhaora, dhamora dhanada* (Mar.—B.C.); *Dho* (Dam.; Sau.); *Arma* (Gond.—Jub.; Seo.); *Dhaoda* (Kur.—Mel.).

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A middle sized tree, with smooth, almost white bark, shed in thin roundish flakes. Leaves alt. or sub-opp. broadly elliptic, obtuse, 2-4 in. long. Fls. yellow, in small dense heads, on short peduncles. Fr. small, winged, beaked, several crowded in a globular head.

Fls. *May-July.*; fr. *Nov.-Jan.*; leaves fall, *Jan.-Feb.*, usually turning red before falling; leaves renewed, *May-June.*

Common throughout the area in all classes of forest.

The wood is extremely strong and tough, and on that account highly valued for all kinds of agricultural implements. It gives a good fuel and excellent charcoal. It yields a useful white gum. The leaves are used very generally for tanning, and sometimes the bark.

271. **Anogeissus sericea,** *Brandis.* Br. 315; G. 347; C. i. 482. Vern. *Kardhahi* (Jub.; Sau.; Hosh.; Seo.).

A middle sized tree. Leaves alt. elliptic, shortly acuminate, 1-2½ in long, clothed beneath with long silky hairs. Fl. heads yellow, ¾ in. diam., on long ax. peduncles, often bearing 2 to 3 fl. heads. Fr. broader than long, crowned by the persistent calyx tube which is as long as the fr.

Fls. *Feb.-Apr*; fr. *May-June*; leaves fall, *Feb.-Mar.*; leaves renewed, *Mar.-Apr.*

An unevenly distributed species. Fairly common on black soil and alluvial tracts in valleys among trap hills, Jub.—(Hole); Sau (Gharakota Res.—[Brandis]). Common on the Pachmarhi hills, Hosh.; Seo. (along the Nerbudda).

This and the following species seem to come very close together. With the assistance of the Forest Botanist, the matter is now under investigation in the Gharakota Res., Sau., where what appears to be this species is found growing alongside specimens of *A. pendula*, Edgew., which occurs gregariously in the same area.

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272. **Anogeissus pendula,** *Edgew.* F. B. I. 451 ; Br. 315 ; G. 348 ; C. i. 483. Vern *Kardhahi* (Sau. ; Dam.) ; *Kala dhaura* (Ni.).

A small to large gregarious tree, often with drooping branches. Leaves alt. or sub-opp., typically broadly elliptic or obovate, ¾-1 in. long, clothed with soft appressed hairs. Fl. heads under ¼ in. diam., on slender ax. peduncles ½-1 in. long. Fr. nearly orbicular, the persistent calyx tube (beak) shorter than the fr.

Fls. *Aug.-Sep.* ; *Mar.-Apr.* (Gharakota Res., Sau.) ; fr. *Nov.-Jan.* ; leaves usually turn red before falling in *Jan.-Feb.* ; leaves renewed, *Mar.-Apr.*

Very local in distribution, occurring gregariously. In Sau. it is common in the Gharakota Res., where it is gregarious on a ridge of sandstone, the seedlings and saplings, which are strongly spinous, forming dense and almost impenetrable thickets ; also scattered in Rahatgarh Res. and Jallandhar Res. ; Dam. (frequent in the Northern R.); Hosh. (Naigaon) ; Ni. (confined to the island of Onkar Mandhata on the Nerbudda).

There would appear to be some confusion between this and the preceding species. Brandis quotes Gharakota Res., Sau., as a locality for *A. sericea*, but does not do so for *A. pendula*, although the latter species appears to be the commonest of the two in this locality. *A. pendula* has recently been found in full fl. in *Mar.-Apr.* in the Gharakota Res. which does away with one of the distinctions separating it from *A. sericea*. Both species are under investigation in this Res. at the present time.

273. **Anogeissus coronata,** *Stapf.* (near A. pendula). Vern. *Kardhahi* (Seo.).

This species has recently been separated from *A. pendula*, Edgew. It differs from *A. pendula* in having markedly small orbicular leaves, ½ to ¾ in. long.

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Fls. *June-Aug.*

Its main habitat is Merwara and Ajmere. Specimens in fl. which have been received from Seo. found along the Nerbudda river, closely approach this species. It is described as "a tree 30-40 ft. in height, 4-6 ft. in girth with hanging branches. Bark roughish dark brown to black like that of Babul."—(F. D. O., Seoni.) The species requires further investigation.

274. **Combretum decandrum,** *Roxb.* F. B. I. ii. 452; Br. 312; G. 349; Watt ii. 514. Vern. *Piwarvel* (Mar.—Berar).

A large scrambling climber. Leaves opp. elliptic-oblong, abruptly acuminate, nearly glabrous, 3-6 in. long. Fls. small, in large term. panicles, with large conspicuous bracts turning creamy white. Fr. 1 in. long with 5 broad wings.

Fls. *Nov.-Feb.*; fr. *Apr.-June.* Evergreen.

Along streams. Am.; Bul.; Mel. and probably in other Divisions.

275. **Combretum ovalifolium,** *Roxb.* F. B. I. ii. 458; Br. 313; G. 348; C. i. 484; Watt ii. 514. Vern. *Dimarbola* (Jub.; Sau.; Seo.); *Hathisandan* (Jub.; Dam.); *Rhelbel, retal* (Ni., Mel.).

A large climber. Leaves opp. elliptic, acuminate, glabrous, 3-5 in. long. Fls. small, white, in ax. and term. panicled spikes, the conspicuous bracts of preceding species being few or absent. Fr. ¾ in. long, pale-brown, with 4 wings.

Fls. *Feb.-Apr.*; fr. *May-June*; leaves turn red before falling in *Feb.-Mar.*; leaves renewed, *May-June.*

Common along streams completely covering other trees and forming thickets in ravines. Jub.; Sau.; Dam.; Hosh.; Seo.; Ni.; Mel.; Berar (Br.).

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276. **Combretum nanum,** *Ham.* F. B. I. ii. 457 ; Br. 313 ; G. 349. Vern. *Ninga mali, kena* (S. Man.).

A small undershrub with thick woody root-stock and numerous erect branches, 1-2 ft. high. Leaves opp., obovate, 1½ in. long. Fls. white, in long racemes. Fr. 1 in. long, pink or reddish, 4-winged.

Fls. *Mar.-May ;* fr. *Apr.-July ;* leaves turn bright red before falling in *Jan. ;* new shoots and leaves *Mar.-Apr.*

On grass lands in Sal forest throughout S. Man. The shoots are burnt back annually by the forest fires.

277. **Calycopteris floribunda,** *Lamk.* F. B. I. ii. 449 ; Br. 314 ; G. 345 ; C. i. 481 ; Watt ii. 50. Vern. *Kukurranj.*

A large woody climbing shrub with rusty villous shoots. Leaves opp., ovate or elliptic, acuminate, 2½-5 in. long, gland-dotted and rusty pubescent beneath. Fls. yellowish-green, in pubescent term. panicles. Fr. ellipsoid, ⅓ in. long, 5-ribbed, surrounded by the enlarged calyx lobes.

Fls. *Feb.-Apr. ;* fr. *May.*

Reported from Seo. but I have seen no specimens.

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278. **Quisqualis indica,** *Linn.* F. B. I. ii. 459 ; Br. 314 ; G. 350 ; C. i. 486 ; Watt vi. pt. i, 388. The Rangoon Creeper.

A semi-scandent shrub with elliptic acuminate leaves and showy fls. at first white then red.

Fls. *Mar.-Apr.*

Commonly planted in gardens.

MYRTACEÆ.

279. **Eugenia Jambolana,** *Lam.* F. B. I. ii. 499 ; Br. 323 ; G. 361 ; C. i. 492 ; Watt. iii, 284. Vern.

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Jamun (Hin.—N. C.; B. C.); *Jambhul* (Mar.—B. C.); *Lendi* (Gond.—Seo.).

A large tree. Leaves opp., elliptic or elliptic-lanceolate, 3"-6" long, gland-dotted, shining, with numerous fine parallel secondary nerves. Fls. white, fragrant, in laxly panicled compound cymes. Fr. a sub-globose berry, dark-purple, juicy, edible.

Fls. *Mar.-May*; fr. *June-July*; evergreen. Renews the leaves with fls.; new shoots *Dec.-Feb.*

Common along the banks and in the beds of streams throughout the area. Also planted in villages.

The wood which is reddish-brown is used for well-work as it resists the action of water. The fr. is largely eaten, and the tree is accordingly cultivated. In Assam the bark is used for dyeing and tanning.

280. **Eugenia Heyneana,** *Duthie.* F. B. I. ii. 500; Br. 323; G. 362; C. i. 493; Watt iii. 284. Vern. *Katjamun* (Hin.—N. C.; B. C.); *Jamnera* (Gond.—Jub.; Seo.).

A shrub or small bushy tree with lanceolate acuminate leaves, 3-5 in. long. Fls. as in preceding. Fr. oblong, ½ in. long, crowned with the cup-shaped calyx limb.

Fls. *Apr.-June*; fr. *July-Aug.*; evergreen. New foliage *Mar.-Apr.*

Gregarious in the beds of streams throughout the area but not very common.

The fr. is eaten by natives.

281. **Barringtonia acutangula,** *Gaertn.* F. B. I. ii. 508; Br. 330; G. 363; C. i. 496; Watt i. 401. Vern. *Tiwarang* (Yeo.); *Tiwar, piwar* (Chin.).

A small tree. Leaves alt., obovate or oblanceolate 2-5 in. long, narrowed into a very short petiole. Fls. red, in long slender pendulous racemes, 6-15 in. long. Fr. oblong, quadrangular, 1 in. long.

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Fls. *Oct.-Dec.*; also *Apr.-May*; fr. *Sep.*; evergreen, leaves shed and renewed, *Mar.-Apr.*

Along banks of streams and in moist places. Yeo. (Peinganga river, Kinwat Res.); Chin (Sillewani R.).

The wood is used for boat-building, well-work, and carts. The bark is used to intoxicate fish, and for tanning in Burma. The leaves and fr. are used in native medicine.

282. **Careya arborea**, *Roxb.* F. B. I. ii. 511; Br. 332; G. 364; C. i. 497; Watt. ii. 157. Vern. *Kumbhi. kumbi* (Hin.—N. C.; B. C.); *Kummar* (Jub.); *Gummar* (Gond.—Jub.; Seo.); *Kumhi* (Seo.; Dam.; Sau.).

A middle sized tree. Leaves alt., obovate, 6-15 in. long, crenate, narrowed into a short petiole, clustered towards the end of the branchlets. Fls. large, 2-4 in. across, white and pink, sessile, with numerous long stamens giving the fl. a peculiar feathery appearance. Fr. green, globose, 2-3 in. diam. crowned with the persistent calyx.

Fls. *Mar.-Apr.*; fr. *June-July*; leaves fall, *Jan.-Feb.*; leaves renewed, *Apr.*, at first red.

Throughout the area in the better class forests. Common on the Chikalda plateau, Mel.

The wood is not much used in this area. Elsewhere it is used for house-posts, planking, carts and furniture. Fuses for native guns are made from the inner bark, from which also a fibre for coarse cordage is obtained. The leaves and young fr. are eaten in Berar.

283. **Careya herbacea**, *Roxb.* F. B. I. ii. 510; Br. 332; G. 364; Watt ii. 158. Vern. *Kumbhi* (S. Man.).

An undershrub with a thick woody root-stock, sending up annually (after the fires of the hot season) dwarf shoots with cuneate obovate serrulate leaves, 6-8 in. long, at first red, and one or two large term. purple fls. Fr. 1-1½ in. diam.

Fls. *June-July*; new shoots *Apr.-May*.

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On open grass lands in Sal forest, S. Man.

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284. **Psidium Guava,** *Linn.* F. B. I. ii. 468; Br 326; G 355; Watt vi. p. i, 351. The Guava tree. Vern. *Amrud, bihi* (Hin.).

A small tree with elliptic-oblong leaves and large white fls., extensively cultivated for its fr. which is eaten and largely used to make jelly.

The bark is used in medicine as an astringent. Indigenous in tropical America.

MELASTOMACEÆ.

285. **Melastoma malabathricum,** *Linn.* F. B. I. ii. 523; Br. 333; G. 366; C. i. 500; Watt v. 210.

A much branched shrub, 8-12 ft., young parts and nerves of the leaves beneath clothed with appressed, flat, lanceolate, acuminate hairs. Leaves opp., ovate-oblong, 3-4 in. long, strigose, 3-5 nerved from the base, the outernerves close to the margin. Fls. purple 2-3 in. across, in term. clusters. Fr. ovoid, ½ in. long.

Fls. *Mar.-May;* evergreen.

Along streams Hosh. (Roarighat, Pachmarhi Hills).

The pulp of the fr. is eaten.

LYTHRACEÆ.

286. **Lagerstrœmia parviflora,** *Roxb.* F. B. I. ii. 575; Br. 338; G. 371; C. i. 512; Watt iv. 583. Vern. *Lendia* (Hin.—N. C.; B. C.); *Seja, karia seja* (Sau.; Dam.; Jub.); *Seina* (Gond.—Jub.); *Lendi* (Mar.—Yeo.); *Laraiya* (S. Man.); *Chakrey, Chakrej* (Kur.—Mel.).

A middle sized tree with ash coloured bark, flaking off in dark coloured strips. Leaves opp., sessile, elliptic-oblong, acute, 2-4 in. long, pale beneath. Fls. white, fragrant, in ax. and term. panicles. Fr. a leathery greenish-brown ellipsoid capsule, 1 in. long, opening in 3 valves and remaining long on the tree.

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Fls. *Apr.-June ;* fr. ripens *Dec.-Jan.*, but remains long on the tree ; leaves fall, *Feb.-Mar. ;* leaves renewed *May-June.*

Common throughout the area and on all classes of soil.

The wood is tough and elastic and highly valued for poles for house construction, and agricultural implements. It gives an excellent fuel and good charcoal. The bark and leaves are occasionally used in tanning leather.

287. **Woodfordia floribunda,** *Salisb.* F. B. I. ii. 572 ; Br. 341 ; G. 369 ; C. i. 510 ; Watt vi. pt. iv, 312. Vern. *Dhawai* (Hin.—N. C.) ; *Dhawi* (Seo. ; Bet. ; Am. ; Dindori Tahsil, S. Man.) ; *Surteli* (Gond.—Jub. ; Seo. ; S. Man.) ; *Dhawati, dhayri* (Mar.—Berar) ; *Dhi, dhin* (Kur.—Mel.) ; *Son dhaura* (Ni.).

A bushy shrub, 4-8 ft. Leaves opp., sometimes in whorls of 3, sessile, ovate-lanceolate, 2-4 in. long, acute, finely pubescent, gland-dotted beneath Fls. scarlet, tubular, in lateral clusters along the branches. Fr. a capsule ⅜ in. long.

Fls. *Jan.-Apr. ;* fr. *Apr.-May ;* semi-deciduous, *Mar.-Apr. ;* leaves renewed, *May-June.*

Common in all Divisions. Partial to rocky places, frequently growing out of old stone walls.

The fls. give a red dye which is used for dyeing silks and cloths.

288. **Lawsonia alba,** *Lamk.* F. B. I. ii. 573 ; Br. 340 ; G. 370 ; C. i. 511 ; Watt iv. 597. Vern. *Mehndi* (Hin.—N. C. ; B. C). The Henna tree.

A much branched shrub, often spinous. Leaves opp., lanceolate or elliptic, 1-1½ in. long. Fls. small, yellowish-white, fragrant, in term. panicled masses. Fr. a small brown globose capsule, irregularly dehiscent.

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Fls. and fr. at different seasons but mainly *July-Dec.*; fr. often remains long on the tree; semi-deciduous, *Apr.-May*.

Doubtfully indigenous in this area, but commonly planted in hedges and gardens throughout the area.

The plant is the Henna of Egypt; the powdered leaves made into a paste are used to dye the nails and hair red.

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289. **Lagerstrœmia indica**, *Linn.* F. B. I. ii. 575; Br. 338; G. 371; C. i. 514; Watt iv. 583.

A shrub with showy white, pink or mauve fls. with crinkled petals.

Commonly planted in gardens.

290. **Punica granatum**, *Linn.* F. B. I. ii. 581; Br. 341; G. 377; C. i. 515; Watt vi. pt. i, 368. The Pomegranate Vern. *Anar.*

A small tree with opp. oblong-lanceolate leaves, and bright scarlet fls.

Cultivated in gardens for its fr. and fls.

ONAGRACEÆ.

291. **Jussiæa suffruticosa**, *Linn.* F. B. I. ii. 587; C. i. 516; Watt iv. 556.

A much branched small erect shrub, 1-4 ft., stems woody below. Leaves alt., sessile, lanceolate, 2-3 in. long, pubescent, lateral nerves numerous, prominent beneath. Fls. yellow, solitary, in the axils of the upper leaves. Fr. a membranous, 8-ribbed capsule, 1-1½ in. long with very numerous minute seeds.

Fls. *Sep.-Nov.*; also *Apr.-May*.

Along streams, by the side of tanks, and in swampy places. Sau. (Cheola-Baleh tank); Mel.; Hosh. (Malni Res.); Ni. (Chandgarh Res.).

SAMYDACEÆ.

292. **Casearia graveolens**, *Dalz.* F.B.I. ii. 592; Br. 343; G. 378; C. i. 520; Watt ii. 209. Vern. *Girchi* (Gond.

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—S. Man.; Hosh.; Bet.; Jub.; Chin.; Sau.); *Riwit, riyet* (Kur.—Mariampur, Mel.).

A small erect tree with long spreading somewhat pendulous branches. Leaves alt. elliptic, 4-8 in. long, more or less serrate, glabrous. Fls. small, green, with an offensive odour, clustered in the axils of leaves or fallen leaves. Fr. a conspicuous yellow 3-valved capsule, ¾ in. long.

Fls. *May-June*; fr. *May-July*; leaves turn copper colour in *Dec.* and are shed in *Jan.-Feb.*; leaves renewed, *June*.

In valleys in hilly localities. Jub.; Sau. (Basa Res.); Chin. (Umreth R.); S. Man.; Hosh.; Bet.; Ni. (Kalibhit R.); very common Mel.—(*Donald*); Seo.

The wood is of little value. The fr. is used for poisoning fish.

293. **Casearia tomentosa**, *Roxb.* F. B. I. ii. 593; Br. 343; G. 379; C. i. 520; Watt ii. 209. Vern. *Bheri* (Hin.—Jub.; Chin.; S. Man.); *Banbheri* (Jub.); *Tundri* (Gond.—Jub.; Sau.; Chin.; Bet.; Seo.); *Chilla* (Hin.—Sau.; Yeo.); *Kesa* (Kur.—Mel.; Ni.).

A small tree differing from preceding in the leaves, branches and fls. being tomentose. Fr. green, 6-ribbed, 3-valved, 1 in. long. Seeds embedded in a red pulp.

Fls. *Feb.-Apr.*; fr. *Apr.-June*; sub-deciduous, *Feb.-Mar.*; leaves turn red before falling.

In the damper forests, chiefly in valleys, more frequent than preceding. Jub.; Sau. (Basa Res.); Chin.; Seo.; S. Man.; Ni.; Bet.; Yeo.; Mel.

The fr. is used for poisoning fish.

PASSIFLORACEÆ.

294. **Passiflora fœtida**, *Linn.* F. B. I. ii. 599; C. i. 524.

A creeper with 3-lobed leaves and white or pale mauve fls. of the ordinary Passion fl. type, each fl. surrounded by a

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remarkable moss-like involucre. A native of tropical America, often planted in gardens, and frequently found as an escape. Civil station, Khandwa, Ni.

295. **Carica Papaya.** *Linn.* F. B. I. ii. 599; Br. 345; C. i. 524; Watt ii. 158. Vern. *Papaya.*

A soft wooded tree with large pinnatifid leaves and fragrant white fls. Is commonly cultivated in gardens for its fruit. The leaves have the property of rendering meat wrapped up in them, tender. The milky juice of the unripe fr. is used in medicine.

CUCURBITACEÆ.

[The Melons, Pumpkins and Gourds so common on the houses and fences of every village are typical members of this family. They are almost without exception climbers furnished with tendrils. The leaves are usually palmately divided.]

296. **Trichosanthes palmata,** *Roxb.* F. B. I ii. 606; C. i. 526; Watt vi. pt. iv, 84. Vern. *Kahira* (Sau.; Chin; Hosh.); *Kaundal* (Mel.).

A climber, woody below. Tendrils 2-3 cleft. Leaves alt., palmately 3-5 lobed, 2-5 in. long and as broad, scabrous with small scales above, base cordate; lobes dentate. Male fls. white, in ax. 5-10 fld. racemes, with fringed petals. Fem. fls. ax. solitary. Fr. globose, 1½ 2 in. diam., red when ripe, streaked with 10 orange streaks.

Fls. *June-Aug.*; fr. *Aug.-Sep.*

On old walls, rocky places, and climbing over trees. Sau.; Ni.; Mel.; Chin.; Hosh.

The fr. and root are used in native medicine.

297. **Trichosanthes cucumerina,** *Linn.* F. B. I. ii. 609; C. i. 527; Watt vi. pt. iv, 82. Vern. *Parmal* (Sau.); *Banparmal* (Chin.).

An annual climber. Tendrils 2-3 fid. Leaves, alt. subreniform, 2-5 in. diam., 5-lobed, distantly denticulate,

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base deeply cordate. Fls. as in preceding, but ebracteate. Fr. 1-3 in. long, ovoid-fusiform, tapering at both ends, scarlet when ripe.

Fls. *July-Aug.*; fr. *Aug.-Sep.* Annual appearing with the rains.

In hedges. Sau.; Chin. (Sillewani R.).

The tender shoots, fr. capsule and seeds are used medicinally as a febrifuge and laxative.

298. **Luffa acutangula,** *Roxb.* var., amara, *C. B. Clarke.*

F. B. I. ii. 615; C. i. 532; Watt v. pt. i, 94. Vern. *Turai* (Sau.; Ni.); *Karu turai* (Mel.); *Jangli dodka* (Ak.).

An annual climber, stems 5-angled. Tendrils 3-fid. Leaves alt. orbicular, 6-8 in. diam., 5-lobed, villous when young, at length scabrid. Male fls. yellow, in 12-20 fld. racemes, 4-6 in. long. ♀ fls. solitary. Fr green, obovoid, 2-4 in. long, 10-ribbed.

Fls. *July-Aug.*; fr. *Sep.-Oct.* Annual appearing with the rains.

Common in hedges. Mel.; Ak.; Ni.; Sau.

The whole plant is exceedingly bitter; the seeds are used in medicine as an emetic.

This is the ordinary wild Turai but the cultivated form "acutangula" is commonly met with in villages where it is grown as a vegetable. It may be distinguished by its more vigorous growth and by the large 10-ribbed almost winged fr. which is very conspicuous hanging in hedges in the cold weather after the seeds have fallen. Excellent Luffas (the fibrous network of the fr.) can be prepared from the fr. almost as good as those of L. ægyptiaca which is the source of the commercial Luffa.

299. **Luffa echinata,** *Roxb.* F. B. I. ii. 615; C. i. 533; Watt v. 97.

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Climbing annual. Stems slender, furrowed. Tendrils 2-fid. Leaves as in preceding but only 1½-2½″ in diam. Male fls. white, on long peduncles up to 8 in. with 5-12 fls. at the apex. Fr. ellipsoid, 1 in. long, not ribbed, clothed with bristles marginally fringed with hairs.

Fls. *July-Aug.*; fr. *Aug.-Sep.*

Scarce. Ni.

In N. India the fr. is considered to be a remedy for dropsy.

300. **Momordica Charantia,** *Linn.* F. B. I. ii. 616; C. i. 528; Watt v. 256. Vern. *Karela* (Hin.—Jub.; Sau.; Chin.; Seo.); *Kartola* (Mel).

Climbing annual; stems angled, pubescent. Tendrils simple. Leaves alt., orbicular, 1-3 in. diam., cut almost to the base into 5-7 sinuate or sub-pinnatifid lobes. Fls. lemon-yellow, solitary, peduncled, with a reniform bract about the middle of the male peduncle, and base of the female. Fr. bright orange, fusiform, 2-6 in. long, covered with triangular tubercles.

Fls. *July-Aug.*; fr. *Aug.-Sep.* Annual appearing with the rains.

Common in hedges and widely cultivated in villages.

Jub.; Sau.; Seo.; Chin.; Mel. and probably throughout the area.

The fr. is eaten cooked in curries, or fried. It is considered tonic and cooling, and is used in rheumatism and gout.

301. **Momordica dioica,** *Roxb.* F. B. I. ii. 617; C. i. 529; Watt v. 258. Vern. *Kartola* (Ak.; Mel.); *Deodar* (Sau.); *Kakora* (Chin.).

A perennial climber with tuberous roots. Stem furrowed, glabrous. Tendrils simple. Leaves alt., broadly ovate, 1-3 in. long, more or less 3-5 lobed, distantly denticulate, glabrous. Fls. yellow, solitary, each male fl. surrounded by a large hood-shaped bract; ♀

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fls. with a small bract near the base of peduncle. Fr. orange, ellipsoid, 1-2½ in. long, densely covered with soft spines. Seeds enclosed in a red pulp.

Fls. *July-Aug.*; fr. *Aug.-Sep.*

Common in hedges. Sau.; Ni.; Ak.; Mel.; Chin. (Sillewani R.).

The mucilaginous tubers are used medicinally.

302. **Momordica Cymbalaria,** *Fenzl.* F. B. I. ii. 618; C. i. 531; Watt v. 258. Vern. *Kartola* (Mel.).

A perennial climber with tuberous root. Tendrils simple. Leaves alt., orbicular, 1-2 in. diam., slightly 5-7 lobed, glabrous. Fls. white with a yellow centre, in 2-5 fld. racemes, with no bract. Fr. spindle-shaped 1 in. long, fleshy, dark-green, 8-ribbed.

Fls. *July-Aug.*; fr. *Aug.-Sep.*

Common in hedges in the rains. Mel.; Ni.

303. **Cucumis trigonus,** *Roxb.* F. B. I. i. 619; C. i. 535; Watt ii. 635. Vern. *Indwan* (Sau.; Hosh.; Chin.).

A perennial climber, scabrid. Stems slender, angled. Tendrils simple. Leaves orbicular, 1-2 in. diam., deeply 5-7 lobed, lobes denticulate, scabrid on both surfaces. Fls. small, yellow; male fls. in small clusters; fem. fls. solitary. Fr. ellipsoid 1½ in. long, glabrous, yellow when ripe with 10 longitudinal green stripes.

Fls. *July-Aug.*; fr. *Aug.-Sep.*

Sau. (Rahatgarh); Hosh. Should be common throughout the area. A form with the fr. covered with jointed hairs is reported as common near Chikalda, Mel. by Donald.

304. **Zehneria umbellata,** *Th.* F. B. I. ii 625; C. i. 540; Watt vii pt. iv, 355. Vern. *Gulakri* (Sau.; Chin.).

Climbing; root perennial, tuberous. Tendrils simple. Leaves 3-6 in. long, polymorphous, ovate, deeply 3-5

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lobed or hastate, denticulate, scabrid above. Fls. small yellowish-white; male fls. 15-20, cormybose on a short peduncle; fem. fls. solitary. Fr. ellipsoid, 1½-2 in. long, ribbed, scarlet when ripe.

Fls. *July-Aug.*; fr. *Aug.-Sep.* Appears with the rains.

Common in hedges. Sau.; Chin. (Sillewani R.).

The fr. is eaten by natives. The juice of the plant is used medicinally in the Konkan.

305. **Mukia scabrella,** *Arn.* (Syn. Melothria maderaspatana, *Cogn.*). F. B. I. ii. 623; C. i. 539; Watt v. 287. Vern. *Silkakri* (Sau.).

Annual rough hispid climber. Tendrils simple. Leaves deltoid-ovate, 1-3 in. long, entire or 3-5 lobed, dentate, scabrid above, hispid beneath. Fls. small, pale-yellow; male fls. in fascicles on short peduncles. Fr. the size of a pea, red, almost sessile, in the axils of the leaves.

Fls. *Aug.-Sep.*; fr. *Oct.-Nov.* Appears with the rains.

Common in village hedges. Sau.; Mel.

The root, leaves and seeds are used in native medicine.

306. **Coccinia indica,** *W. et. Arn.* F. B. I. ii. 621; C. i. 538; Watt ii. 252. Vern. *Dhorkakri* (Mel.); *Indravan* (Yeo.); *Kundru* (Ni.; Chin.).

Perennial climber. Tendrils simple. Leaves 2-4 in. long and broad, 5-angled or 5-lobed, 5-nerved from a cordate base, lobes toothed. Fls. large, white, solitary. Fr. spindle-shaped, 1-2 in. long, scarlet when ripe.

Fls. *Aug.-Sep.*; fr. *Sep.-Oct.*

Common in hedges. Ni. (Burhanpur); Yeo.; Mel.; Chin.

The fr. both raw and cooked is eaten by natives. The root is used in native medicine as a cathartic.

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307. **Bryonopsis laciniosa,** *Naud.* F. B. I. ii. 623; C. i. 534; Watt i. 542. Vern. *Bolbilaia* (Sau.).

Annual climber; stems glabrous. Tendrils 2-fid. Leaves 3-6 in. long, scabrid above, deeply palmately 5-lobed, margins sinuate, distantly denticulate. Fls. small, yellow; male fls. in small fascicles; fem. fls. solitary. Fr. globose, $\frac{3}{4}$ in. diam., red when ripe, streaked with 8 white vertical lines.

Fls. *Aug.-Sep.*; fr. *Sep.-Oct.* Appears with the rains; dies down *Jan.*

Common in village hedges. Sau.; Ni.; Mel.

The plant is bitter and aperient. It is used as a medicine by the Santals.

308. **Corallocarpus conocarpa,** *Hook f.* F. B. I. ii. 628; C. i. 544. Vern. *Bagnatho* (Sau.).

Annual climber. Tendrils simple. Leaves 2-3 in. long, deeply 3-5 lobed, pubescent. Fls. greenish-yellow; male fls. 6-15, at apex of a short peduncle. Fr. conical-oblong, opening near the base so that the upper portion which is orange-red comes off like a cap (operculately dehiscent) from the cup-shaped base which remains green.

Fl. and fr. *July-Sep.*

Scarce. Khandwa, Ni.; Sau. (Karta)

309. **Ctenolepis Garcini,** *Naud.* (Syn. Blastania Garcini, *Cogn.*). F. B. I. ii. 629; C. i. 542; Watt ii. 626.

Annual climber. Tendrils simple. Leaves orbicular, 1-2 in. diam., deeply 3-5 lobed, denticulate, scabrid with white spots. Stipular bracts, rotundate, fringed with long filiform cilia. Fls. yellowish-white, minute. Fr. small, kidney or hammer-shaped, bright red, glabrous.

Fls. *July-Aug.*; fr. *Aug.-Sep.* Appears with the rains. Common in hedges, Ni.

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CACTACEÆ.

310. **Opuntia Dillenii,** *Haw.* F. B. I. ii. 657 ; Br. 346 ; G. 382 ; C. i. 552 ; Watt v. 490. The Prickly-pear. Vern. *Nagphani* (Hin.—N. C. ; B. C.)

A succulent plant with jointed flattened fleshy stems, bearing dense woolly irritant hairs with tufts of numerous bristles and long sharp spines. Fls. yellow tinged with red. Fr. fleshy, pear-shaped, bearing spines near the apex.

Fls. and fr. *Apr.-Sep.; Nov.-Dec.* (Sau.).

Common throughout the area, planted as a hedge and run wild. When once established it is difficult to eradicate as in the Civil Station of Khandwa. Introduced from America.

The Cochineal insect of Central America thrives on this species. The fr. is eaten in times of scarcity.

ARALIACEÆ.

311. **Heptapleurum venulosum,** *Seem.* F. B. I. ii. 729 ; Br. 348 ; G. 386 ; C. i. 574. Vern. *Deo-semar* (Gond.—S. Man.) ; *Barna* (Baiga—S. Man.).

A large climbing or epiphytic glabrous shrub. Leaves alt., digitate ; leaflets 5-7, elliptic-oblong, 3-6 in. long, acuminate. Common petiole stout, 3-9 in. long ; petiolules 1-2 in. long. Fls. small, yellowish green, in panicled umbels. Fr. sub-globose, 5-ribbed, ¼ in. diam.

Fls. *Mar.-Apr.* ; fr. *May-June.*

At high elevations. S. Man. ; Hosh. (Pachmarhi).

CORNACEÆ.

312. **Alangium Lamarckii,** *Thwaites.* F. B. I. ii. 741 ; Br. 354 ; G. 389 ; C. i. 575 ; Watt i. 153. Vern. *Akol, akola* (Hin., Mar.—N. C. ; B. C.)

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A shrub or small tree with spinescent branchlets, and light coloured bark. Leaves alt., elliptic or oblong-lanceolate, 3-6 in. long, more or less acuminate, glabrous above, sparselp pubescent beneath. Fls. white, fragrant, in ax. fascicles. Fr. ellipsoid, ⅔ in. long, black when ripe, crowned by the persistent calyx, the seed enclosed in a red pulp.

Fls. *Mar-May*, ; fr. *June-July*. More or less leafless at time of flowering ; leaves renewed, *Apr.-May*.

Somewhat local ; usually near nalas. Jub. ; Sau. (Banda and Saugor R.) ; Chin. (Sillewani R.) ; Dam.; Hosh. ; S. Man. ; Seo. ; Ni. (Tapti river) ; Bet. ; Yeo.; Am. and probably in all Divisions.

Yields a good fuel. If of sufficient size would be useful for carving. The root bark is used in native medicine, and has a reputation in leprosy and skin diseases.

RUBIACEÆ.

313. **Anthocephalus Cadamba,** *Miq.* F. B. I. iii. 23 ; Br. 367 ; G. 400 ; C. i. 579 ; Watt i. 266. Vern. *Kadam* (Hin., Mar.).

A large tree with horizontal branches. Leaves opp. elliptic-oblong, 5-8 in. long, acuminate, shining and glabrous above, pubescent beneath. Fls. fragrant, yellow, in solitary term. globular heads, 1½-2 in. diam. Fr. a fleshy receptacle, size of a small orange, yellow when ripe.

Fls. *May-July* ; fr. *Aug.-Oct.*

Not uncommonly planted near villages and in avenues, Jub. ; public gardens, Sau. ; Seo ; Chin. ; Hosh. Not seen wild in this area.

The fruit is eaten. In Assam the wood is used for tea-boxes.

314. **Adina cordifolia,** *Hook f.* F. B. I. iii. 24 ; Br. 368 ; G. 401 ; C. i. 581 ; Watt i. 114. Vern. *Haldu* (Hin.,

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Mar.—N. C. ; B. C.) ; *Hardu* (S. Man. ; Hosh.) ; *Kaim, kem* (Gond.—Jub. ; Seo. ; Chin.) ; *Karam* (Chin.).

A large tree with rough grey bark. Leaves opp., cordate-orbicular, 4-8 in. long and as broad, pubescent beneath. Large oblong stipules concealing the term. leaf buds. Fls. yellow, in globose heads ¾-1 in. diam., peduncled, 2-3 from one leaf axil. Fr. a globular head of small capsules.

Fls. *June-Aug.;* fr. *Feb-May ;* semi-deciduous, *Mar.-Apr. ;* leaves renewed, *May-June.*

Scattered throughout the area, but nowhere plentiful ; usually in hilly localities with a fair depth of soil.

The wood is yellow and is used for planking and construction, agricultural implements and combs.

315. **Stephegyne parvifolia,** *Korth.* F. B. I. iii. 25 ; Br. 369 ; G. 403 ; C. i. 581 ; Watt vi, pt. iii, 360. Vern. *Kalm* (Hin.—Jub. ; Sau. ; Dam. ; Hosh. ; Chin.; Ni. ; Bet. ; Am.) ; *Mundi* (Gond.—S. Man. ; Seo. ; Chin. ; Jub.) ; *Kalmi* (Baiga—S. Man.) ; *Kalam, kalamb* (Mar.—Am. ; Yeo. ; Bul.) ; *Kurum, kurumbo* (Kur.—Mel.).

A medium to large sized tree ; smooth light grey bark with dark exfoliating scales. Leaves opp., broadly-elliptic to suborbicular, 4-6 in. long, acute, glabrous. Stipules obovate enclosing the term. bud. Fls. in pale-yellow globose heads 1 in. diam., 1-3 together, each supported by 2 pale coloured foliaceous bracts. Head of fr. ½ in. diam.

Fls. *June-July ;* fr. ripens following *Mar.-Apr. ;* leaves fall, *Feb.-Mar. ;* leaves renewed, *May-June.*

Throughout the area. Common in low-lying localities with good depth of soil.

A useful wood for furniture, agricultural implements, and small articles such as spoons, combs, etc. The branches are sometimes lopped for cattle fodder.

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316. **Hymenodictyon excelsum,** *Wall.* F. B. I. iii. 35; Br. 371; G. 406; C. i. 582; Watt iv. 317. Vern. *Biharuk, bhurker, mahuwa karar* (Jub.); *Baror, mahuwa padal* (Sau.); *Potur* (Gond.—Jub.; Chin.); *Mahuwa karar, bohar* (S. Man.); *Bhormal* (Chin.); *Bhorsal, bhawarsal* (Mar.—Mel.; Ni.); *bhawasar* (Kur.—Mel.); *Sali* (Seo.)

A large or middle sized tree. Leaves opp., elliptic, 4-10 in. long, narrowed into petiole, pubescent. Fls. small, white, fragrant, in dense compound spikes, in term. drooping panicles, subtended by a pair of large leaf-like bracts. Fr. a brown ellipsoid capsule ¾ in. long.

Fls. *Aug.-Sep.*; fr. *Dec.-Mar.*; leaves turn yellow before being shed in *Nov.-Dec.*; leaves renewed, *June*. Easily recognised when leafless by the persistent panicles of small brown reflexed capsules.

Scattered, nowhere very common; in gullies and valleys in hilly localities. Jub.; Sau. (Jallandhar Res., Baleh Res.); Chin. (Sillewani R.); Seo.; S. Man.; Mel.; Ni. (Kalibhit R., Punasa Res.).

The wood is white, soft and light, and is used for native drums, grain measures, scabbards, etc. The inner bark is bitter and is used in native medicine as a febrifuge.

317. **Wendlandia exserta,** *D. C.* F. B. I. iii. 37; Br. 373; G. 408; C. i. 584; Watt vi. pt. iv, 302. Vern. *Tilwan* (Hin.—Seo.; Dam.; Chin.; Hosh.); *Tilban* (S. Man.; Jub.); *Tilman* (Gond.—Seo.; Jub.) *Telen* (Jub.).

A small tomentose crooked tree. Leaves opp., ovate-lanceolate, 4-8 in. long, acute, with soft grey tomentum beneath. Stipules interpetiolar, recurved. Fls. small, white, fragrant, in large pyramidal term. panicles. Fr. a minute globose capsule.

Fls. *Mar.-Apr.*; fr. *Apr.-May*; evergreen—(Haines), usually deciduous—(Br.).

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Not very common, but where found frequently gregarious. Common on broken ground near water-courses, Jub.; Seo.; Chin.; Dam.; Hosh.; Chikalda, Mel.; Sau. (Branj nadi, Deori R.).

318. **Gardenia lucida,** *Roxb.* F. B. I. iii. 115; Br. 379; G. 415; C. i. 602; Watt iii. 482. Vern. *Dikamali* (Hin.—Chin.; Yeo.; Ak.; S. Man.); *Mali* (S. Man.).

A large shrub or small tree, with smooth grey bark. Leaves opp., elliptic-oblong, 6-10 in. long, acute, glabrous, base narrowed into the short marginate petiole; sec. nerves 20-25 pr. Fls. large, white, fragrant, ax., solitary. Corolla tube 1-2 in. long. Fr. ovoid, or ellipsoid, 1½ in. long, with a thin shell.

Fls. *Apr.-June;* fr. *Apr.-June* (of next year.); evergreen.

Not common. Chin (Sillewani R.); S. Man.; Yeo.; Ak.; but it has probably been overlooked in other Divisions.

A gum resin (dikamali) exudes from wounds in the bark. It has a strong smell and is much used in native medicine for keeping off flies from sores, and in the treatment of cutaneous diseases. The wood is useful for turning and is suitable for combs.

319. **Gardenia gummifera,** *Linn f.* F. B. I. iii. 116; Br. 379; G. 415; C. i. 603; Watt iii. 480. Vern. *Bandarledu* (Seo).

A large shrub with white bark. Leaves opp. sessile, cuneate to obovate, 1½-3 in. long, shining; 12-16 pr. sec. nerves. Fls. large, white, ax., 1-3 together. Fr. ovoid, 1-1½ in. long, pericarp, thick, woody.

Fls. *Feb.-May,* but sporadically at other times—(Haines); fls. *Oct.* (Seo.); fr. *June-July*—(Haines), *Oct.* (Seo.); deciduous.

Scarce, and in consequence probably overlooked. So far only obtained in Seo. (Khurai R.); S. Man. (?).

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Like the preceding species it yields a clear yellow resin from wounds in the bark, which is used for similar purposes.

320. **Gardenia latifolia,** *Ait.* F. B. I. iii. 116; Br. 379; G. 415; C. i. 602; Watt. iii. 482. Vern. *Paphar papra* (Hin.—N. C.; Ni.; Bet.); *Paniabilo* (Gond.—Jub.; Seo.; Chin.; S. Man.); *Piphar* (Baiga—S. Man.); *Gugal* (Mel.; Chin.); *Ghogar* (Mar.—Am.); *Gogarni* (Mar.—Am.; Yeo.).

A small tree with large crown and smooth grey bark. Leaves opp., broadly-elliptic, 4-8 in. long, shining, sec. nerves prominent, 10-15. Fls. large, star-shaped, 3 in. across, pale-yellow fading to orange. Fr. globose, 1-2 in. across, speckled greyish-green.

Fls. *Apr.-May;* fr. ripens *Feb.-Apr.;* leaves fall, *Mar.-Apr.;* leaves renewed, *May-June.*

Common throughout the area.

The wood is white, close and fine grained and suitable for turning. Combs are made of it.

321. **Gardenia turgida,** *Roxb.* F. B. I. iii. 118; Br. 380; G. 416; C. i. 601; Watt iii. 483. Vern. *Karhar* (Hin.—Jub.; Seo.; Chin.; S. Man.); *Chamar karhar* (Sau.); *Khurphendra* (Gond.—Jub.; Seo.); *Phendra* (Mar.—Chin.; Yeo.; Mel.; Am.; Hosh.); *Phetra* (Mar.— Am.; Chin.); *Pendra* (Bet.); *Temria* (Ni.).

A small straight tree, with small crown, smooth pale-grey bark, and armed with strong spines. Leaves opp. obovate, 1-4 in. long, narrowed into the petiole, tomentose beneath, glabrous or pubescent above. Fls. white, fragrant, 1 in. across, males in fascicles, females solitary. Fr. large, globose, 2-3 in. diam., grey, rough.

Fls. *Apr.-May,* when leafless; fr. ripens following *Mar.-May;* leaves fall, *Feb.-Mar.;* leaves renewed, *May-June.*

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Common in all Divisions, chiefly in dry scrub jungle, and on rocky soil.

The fr. is said to be a favourite food with bison.

322. **Randia uliginosa,** *D. C.* F. B. I. iii. 110; Br. 381; G. 412; C. i. 599; Watt vi. pt. i, 391. Vern. *Bhirara* (Hin.—Jub.; Sau.; Dam.; Hosh.); *Pindalu* (Hin.—Bet.; Jub.); *Katul* (Jub.; S. Man.); *Pendra* (Gond.—Jub.; Seo.); *Tirkha* (S. Man.); *Tupkela* (Mar.—Am.; Yeo.); *Ghangru, purput* (Kur.—Mel.); *Kala phendra* (Am.; Ni.).

A small tree, with reddish-brown bark; young branches quadrangular. Leaves obovate, 3-8 in. long, glabrous and shining above, fascicled at the ends of short branchlets, above them 2-4 sharp spines. Fls. large, white, fragrant, waxy, ax., solitary. Fr. ovoid, 2 in. long, yellow, edible.

Fls. *May-June;* fr. ripens *Dec.-Apr.;* leaves fall, *Jan.-Feb.;* leaves renewed, *May-June.*

Common in all Divisions; a characteristic tree of open grass lands and low-lying water-logged soils. In Ni. chiefly on the sandstone formations along the Nerbudda. Frequent in the Sal forests of Jub. and S. Man.

The fr. is eaten by natives in curries; it is astringent and is used in dysentery.

323. **Randia dumetorum,** *Lamk.* F. B. I. iii. 110; Br. 382; G. 413; C. i. 599; Watt vi. pt. i, 389. Vern. *Mainhar* (Hin.—Jub.; Sau.; Dam.; Seo.; S. Man.); *Mainphal* (Hin.—Jub.; Am.; Chin.); *Mendhal* (Mar.—Yeo.; Chin.); *Mendhar* (Ni.; Bet.); *Gera* (Jub.); *Gela* (Mar.—Ak.; Am.); *Hinganbet* (Mar.—Yeo.); *Ghetu* (Kur.—Mel.).

A small bushy tree with grey bark and stout ax. spines. Leaves mostly clustered on short branchlets, obovate, 1-3 in. long, base narrowed into short

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petiole, glabrous or pubescent. Fls. white, turning yellow, 1 in. across, 1-2 at the ends of short leaf bearing branchlets. Fr. size of a crab-apple, smooth, yellow when ripe.

Fls. *May-June;* fr. ripens *Nov.-Jan.;* leaves fall, *Feb.-Mar.;* leaves renewed, *Apr.-May.*

Fairly common in all Divisions. In Ni. chiefly on the sandstone and quartzite formations along the Nerbudda ; frequent in Sal forests, Jub., S. Man.

The unripe fruit is used to poison fish. The bark, rind and fr. are all used medicinally, the pulp of the fr. is a valuable and safe emetic. The wood is of little value.

324. **Canthium parviflorum,** *Lamk.* F. B. I. iii. 136; Br. 385 ; G. 419 ; C. i. 607 ; Watt ii. 129.

A rigid thorny shrub, with stout opp. decussate pairs of straight spines above the leaf axils. Leaves opp., obovate or orbicular, ½-2 in. long, base cuneate, glabrous. Fls. small, yellowish, in short dense cymes. Fr. yellow, globose, ½-1 in. across.

Fls. *May-July ;* fr. *Nov.-Dec.;* leaves fall, *Mar.;* leaves renewed, *June.*

Not common in this area. Mel. (Katkali) ; Ak. (Nornala Fort.)

325. **Ixora parviflora,** *Vahl.* F. B. I. iii. 142 ; Br. 388 ; G. 421 ; C. i. 611 ; Watt iv. 533. Vern. *Kau* (Hin.—Sau. ; Dam. ; Jub.) ; *Lokhandi* (Mar.—B. C. ; Seo. ; Chin.). The Torch tree.

A small much branched tree. Leaves opp., sessile, coriaceous, shining, oblong or elliptic, 3-6 in. long ; interpetiolar stipules. Fls. small, white, scented, in dense term. trichotomous cymes. Fr. depressed globose, ¼ in. diam., black, shining.

Fls. *Mar.-May ; Feb.* (Ni.) ; fr. *May-June;* evergreen, new shoots *Apr.*

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Along nalas and dry water-courses. Throughout the B. C. in hot dry localities. Ni. (Garhtal); Mel. (Chichona. Not on plateaux or higher slopes)—[Donald]; Jub.; Sau. (Bila and Dhasan nalas; Abchand Res.); S. Man. (scarce); Seo.; Dam.; Chin.

The wood is hard and close grained, suitable for turning. The green branches are used for torches.

326. **Pavetta indica,** *Linn.* F. B. I. iii. 150; Br. 387; G. 421; C. i. 612; Watt vi. pt. i, 114. Vern. *Nerusa, rusa* (Sau.).

A large much branched shrub, 5-10 ft., glabrous or tomentose; branchlets sub-quadrangular. Leaves opp., elliptic or obovate, 3-8 in. long, narrowed into petiole, glabrous or pubescent. Fls. white, scented, in large 3-chotomous corymbose cymes. Fr. globose, ¼ in. diam., black, smooth.

Fls. *June-Aug.*; fr. ripens *Nov.-Jan.*

Not very common, but where it occurs, frequent. Sau. (Jhilla, along Bina river; Garola); S. Man. (Karanjia, in Sal forest); Seo.; Chin. (Umreth R.).

The root is used in native medicine.

There are two distinct varieties in this area—var. 1 *indica* proper, the leaves and inflorescence glabrous; var. 2 *tomentosa*, branchlets, leaves and inflorescence tomentose. The former is found in Sau., the latter in S. Man., Seo.

327. **Hamiltonia suaveolens,** *Roxb.* F. B. I. iii. 197; Br. 390; G. 425; C. i. 621; Watt iv. 200. Vern. *Bhowarmal* (Chin.; Seo.; Jub.); *Barcha* (Ni.). A small shrub, stems almost herbaceous. Leaves opp., stiff, elliptic-lanceolate, 5-8 in. long, acute. Fls. pale-lilac or white, fragrant but fœtid when crushed, in large term. 3-chotomous panicles. Fr. a small 5-valved capsule.

Fls. *Nov.-Jan.*

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On dry rocky soil. Ni. (Chandni R., Kalibhit Res.); Mel.; Seo.; common in dry places, especially on trap, Jub.; Chin. (Sillewani R.).

328. **Morinda tinctoria,** *Roxb.* F. B. I. iii. 156; Br. 392; G. 422; C. i. 614; Watt v. 274. Vern. *Ahl, al* (Hin.—Seo.; Jub.; Chin.; B. C.); *Alua* (Sau.); *Ali* (Gond.—Jub.).

A small or middle sized tree with deeply cracked, greyish-yellow, corky bark; branchlets 4-angled. Leaves opp. elliptic-obovate, 4-8 in. long, pubescent, narrowed into the petiole. Fls. white, fragrant, in solitary, ax. or leaf-opposed stalked heads. Fr. ellipsoid, green, fleshy, consisting of a number of coalescent drupes.

Fls. *Mar.-June;* fr. ripens *Jan.-Feb.;* evergreen (?).

Throughout the B. C. Frequently cultivated, Berar—(Brandis). At one time cultivated at Khandwa, Ni. Fairly common, Sau.; Jub.; Seo.; Chin. (Sillewani R.); Dam.

The bark of the root yields a red dye of considerable value and much used for turbans, carpets, etc., and in consequence the tree is cultivated in many parts of India (*vide* Watt v. 261, *Morinda citrifolia,* Linn., which is generally looked on as the cultivated form of *M. tinctoria*).

COMPOSITÆ.

329. **Vernonia Roxburghii,** *Less.* F. B. I. iii. 232; Br. 399; Vern. *Burbunda* (?) (S. Man.).

An erect, rigid, scabrid, undershrub. Leaves alt., stiff, elliptic-lanceolate, 3-5 in. long, serrate, sub-sessile, clothed with stiff hairs. Fls. white, in 30-fld. heads in term. panicles. Fr. a small achene surmounted by a pappus of white hairs.

Fls. and fr. *Nov.-Jan.*

A common undershrub of Sal forests, S. Man.; Jub.

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330. **Vernonia divergens,** *Benth.* F. B. I. iii. 234; Br. 399; C. ii. 11. Vern. *Burbunda* (?) (S. Man.); *Mohti.* (Jub.).

A perennial undershrub, 4-6 ft. high, with divergent pubescent branches. Leaves alt., elliptic-lanceolate, 2-5 in. long, serrate, narrowed into the petiole. Fls. white or purplish, in 8-12 fld. heads, in dense, much branched term. panicles. Pappus of achenes dirty white or pale-reddish brown.

Fls. *Oct.-Jan.* Leaves turn purplish-red before being shed.

An undershrub of shady forests, sometimes gregarious. Hosh. (Bori Res., Pachmarhi); Jub.; Bet. (Kamla); Mel. (Chikalda); S. Man.

PLUMBAGINACEÆ.

331. **Plumbago zeylanica,** *Linn.* F. B. I. iii. 480; C. ii. 78; Watt vi. pt. i, 295. Vern. *Chitawar* (Sau.; Chin.; Hosh.); *Chitarak* (Barat, Mel.).

A shrub with straggling green branches, and alt. ovate glabrous leaves, 1½-3 in. long, narrowed into a sheathing petiole. Inflor. in glandular elongate spikes. Fls. white, calyx clothed with longish glandular hairs. Fr. a small oblong capsule.

Fls. and fr. *Aug.-Feb.*

In rocky places. Sau. (Ranipura Res., Rangir Res.); Chin. (Umreth R.); Jub. (Undershrub of shady forests); Hosh.; Mel. (common).

The root is employed in medicine. It is made into a paste and applied in leprosy, and skin diseases, as well as in rheumatism.

MYRSINACEÆ.

332. **Embelia robusta,** *Roxb.* F. B. I. iii. 515; Br. 416; G. 440; C. ii. 85; Watt iii, 243. Vern. *Baibarang* (Hin.—N. C.; Mel.; Ni.); *Dulduli* (Jub.); *Kopaduldul*

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(Gond.—Seo.; western part of S. Man.); *Dhotu* (eastern part of S. Man.); *Brangeli, bharangeli* (Kur.—Mel.).

A large shrub 4-10 ft., with long spreading light grey lenticellate branches. Leaves alt., elliptic, 2-5 in. long, more or less rusty pubescent beneath; petiole ½ in. long. Fls. small, greenish-white, in ax. racemes 1-2 in. long. Fr. a small globose red berry, size of a peppercorn.

Fls. *May-July*; fr. *Dec.-Jan.*; leaves fall, *Feb.-Mar.*; leaves renewed, *May-June*.

In shady places and as undergrowth in the denser forests. Throughout the N. C. Common, Sau. Probably throughout the B. C. but so far only obtained in Ni., Mel.

The fr. is used in medicine as an anthelmintic, also to adulterate black pepper.

333. **Ardisia solanacea,** *Roxb.* F. B. I. iii. 529; Br. 418; C. ii. 86; Watt i. 290.

A large shrub or small tree up to 25 ft. Leaves alt. glabrous, obovate-oblong, 6-10 in. long, narrowed into a short petiole ¼ in. long. Fls. rose-coloured, waxy, 1 in. across, in ax. peduncled corymbs. Fr. depressed globose, ¼ in. diam., black when ripe.

Fls. *Apr.-May*; fr. *Oct.-Jan.* Evergreen.

In shady places, along streams. S. Man. (Karanjia R.); Hosh. (Pachmarhi).

SAPOTACEÆ.

334. **Bassia latifolia,** *Roxb.* F. B. I. iii. 544; Br. 426; G. 447; C. ii. 92; Watt i. 406. Vern. *Mahua* (Hin.—N. C.; Ni.; Bet.); *Mohwa, moh, moho* (Mar.—B.C.); *Iru* (Gond.—Jub.); *Irrud* (Gond.—Seo.); *Mu, mohu* (Kur.—Mel.).

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A large tree with short trunk and large spreading crown. Leaves alt., clustered near the ends of the branches, elliptic, 5-8 in. long. Fls. cream coloured, on rusty tomentose pedicels, in dense clusters at the ends of branches. Easily recognised by the thick fleshy cream coloured corolla which falls to the ground.

Fls. *Feb.-Apr.*; fr. *June-Aug.*; leaves fall, *Feb.-Mar.*; leaves renewed, *Apr.* after flowering, at first crimson coloured.

Very common in all Divisions, both in forest and cultivated land.

The tree is carefully preserved on account of the fleshy corollas which are collected after falling from the tree. They are eaten raw and cooked, after drying. A spirit is extensively distilled from them. From the seeds (Guli) an oil is expressed which is used both for cooking and burning and in many parts of the C. P. is a valuable article of commerce. The wood when obtainable is much prized for naves of wheels and oil-mills as well as for house building.

335. **Mimusops Elengi,** *Roxb.* F. B. I. iii. 548; Br. 425; G. 449; C. ii. 95; Watt v. 249. Vern. *Bhonsari, mulsari* (Hin.—Jub.; Seo.; Ni.; Bet.); *Bakoli* (Sau.).

A large tree. Leaves alt., elliptic, 3-4 in. long, glabrous, shining. Fls. white, fragrant, star-shaped, nearly 1 in. across, in ax. fascicles or solitary. Fr. a smooth, ovoid, yellow berry 1 in. long.

Fls. *Mar.-Apr.* Evergreen.

Not indigenous in this area, but not infrequently planted in gardens and avenues. Jub.; Sau.; Seo.; Ni.; Bet.; Mel. (Chikalda); and no doubt in other Divisions.

The wood is strong and durable and is used in S. India for rice pounders and house building. The bark is used in native medicine, and an oil is expressed from the seeds.

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336. **Mimusops hexandra,** *Roxb.* F. B. I. iii. 549; Br. 425; G. 450; C. ii. 95; Watt v. 251. Vern. *Khirni* (Hin.—N. C.; B. C.).

Usually a small tree in this area. Leaves alt. generally crowded at the ends of branchlets, obovate-oblong, 2-4 in. long, obtuse or emarginate, glabrous, shining. Fls. pale-yellow, ¼ in. across, peduncled in ax. fascicles. Fr. an ellipsoid berry, the size of an olive, reddish-yellow when ripe.

Fls. *Nov.-Dec.*; fr. *Apr.-June*; *Oct.* (Seo.). Evergreen.

Wild but not common near water-courses, Jub.; Hosh. (Bori Res.); Seo. (Ugli R.). Probably wild in other Divisions; doubtfully Sau. (Garola). Commonly cultivated, Chin.; Sau.; Seo.; Am.; Bul.; Ni.; Bet. There are several "khirni baghs" in Berar, one with very old tree at Ellichpur, Mel.

The wood is hard, tough and durable and extensively used in S. India and Ceylon for sugar-mills, oil-presses, tool handles, etc. It yields an excellent fuel. The bark is used in medicine, the fr. is eaten and the seeds give an oil.

EBENACEÆ.

337. **Diospyros Chloroxylon,** *Roxb.* F. B. I. iii. 560; Br. 430; G. 458; C. ii. 105; Watt iii. 137. Vern. *Kauli* (Ni.); *Anduli* (Yeo.).

A small tree with spinescent branches, and rusty-tomentose branchlets. Leaves alt., dark green, somewhat leathery, elliptic or obovate, 1-2 in. long, pubescent. Fls. very small, white, in small ax. clusters. Fr. globose, ⅓ in. diam., glabrous, edible.

Fls. *July-Sep.*; fr. *Dec.-Mar.* Evergreen.

Scarce. Ni. (Biroda, Chandni R.); Yeo. (on the banks of the Wardha river).

The wood is hard and durable, but does not appear to be used except as fuel.

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338. **Diospyros montana,** *Roxb.* F. B. I. iii. 555; Br. 431; G. 454; C. ii. 104; Watt iii. 150. Vern. *Patwan eikh, temri* (Jub.); *Patoh* (Jub.; S. Man.).

A small tree, branches often spinescent. Leaves alt., ovate-oblong, 2-4 in. long, subacute, glabrous or pubescent, base rounded. Fls. (male) white in short 2-8 fld. cymes; fem. fls. solitary, ax., green or yellow. Fr. globose, 1-1½ in. diam., reddish-brown when ripe.

Fls. *Mar.-May*; fr. ripens *Nov.-Jan.*

Apparently not very abundant, but has probably been overlooked in some Divisions. Jub.; S. Man.

Yields a small quantity of inferior ebony. The wood is not durable and is not valued.

339. **Diospyros cordifolia,** *Roxb.* F. B. I. iii. 555; Br. 431; G. 455; C. ii. 105. Vern. *Kharia akol, bistendu,* (Sau.).

A small much branched tree, with blackish bark. Leaves alt., ovate-lanceolate, 1-3 in. long, pubescent, base rounded or cordate. Fls. (male) white, ax. usually 3 together; fem. fls. solitary. Fr. globose, ½-1 in. diam., yellow when ripe.

Fls. *Apr.-May*; fr. ripens *Jan.-Mar.*; almost evergreen; leaves fall, *Mar.*; leaves renewed, *Apr.-May.*

Common on waste land in Saugor Civil Station, on sandstone. (Brandis and F. B. I. include this species under D. montana but it is evidently distinct.)

340. **Diospyros melanoxylon,** *Roxb.* (including D. tomentosa, *Roxb.*) F. B. I. iii. 564; Br. 432; G. 461; C. ii. 99; Watt iii. 147. Vern. *Tendu* (Hin.—N. C.; Bet.); *Tembhurni, temru* (Mar.—B. C.); *Tumri* (Gond. —Jub.; Seo.).

A small or large tree according to locality, with characteristic black bark with deep transverse and

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longitudinal cracks exfoliating in rectangular scales. Leaves mostly opp., coriaceous, elliptic or ovate, 3-12 in. long, tomentose beneath, with 6-10 pr. prominent sec. nerves. Male fls. yellowish, in peduncled tomentose cymes. Female fls. solitary. Fr. globose, 1-1¼ in. diam., smooth, yellow when ripe, supported by the thickened calyx.

Fls. *Apr.-June;* fr. ripens following *Apr.-May;* nearly evergreen; leaves fall, *Apr.-May;* leaves renewed, *May-June*, but coppice shoots and root suckers with deep red leaves appear in *Apr.-May*.

Common throughout the area attaining large dimensions in valleys on black soil.

A valuable timber tree, poles much prized for building. The heartwood of large trees consists of an irregularly shaped mass of black ebony. The fruit which is edible is much sought after by the poorer classes, and is a valuable asset in times of scarcity. The tree reproduces in abundance from root suckers and by coppice shoots.

OLEACEÆ.

341. **Jasminum pubescens,** *Willd.* F. B. I. iii. 592; Br. 449; G. 468; C. ii. 112; Watt iv. 544. Vern. *Kunda* (Hin.—Chin.).

A large more or less scandent shrub; branchlets grey-tomentose. Leaves opp., ovate, 1-3 in. long, acute, base rounded, pubescent. Fls. white, star-shaped, in tomentose compact term. cymes. Calyx teeth 3 times length of the tube. Fr. a double globose black berry ¼ in. diam.

Fls. *Feb.-Apr.*

Wild in S. Man. (Dindori R.); Chin (Umreth R.); not uncommonly cultivated in gardens, Jub.; Seo.

The root is said to be an antidote in cases of snake-bite.

342. **Jasminum arborescens,** *Roxb.* F. B. I. iii. 594; Br. 450; G. 467; C. ii. 112; Watt iv. 541. Vern.

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Chameli (Hin.—N. C.; B. C.); *Jangli johi* (Sau.); *Niwariya* (Dam.; Sau.); *Nawari* (?) (S. Man.).

A large climbing or erect shrub, with grey pubescent branchlets. Leaves opp., ovate, 3-5 in. long, acute, tomentose when young, glabrous when full grown. Fls. white, fragrant, star-shaped, in lax. term. compound cymes. Calyx teeth as long as the tube. Fr. a simple or 2-lobed ovoid oblique black berry ½ in. long.

Fls. *Apr.-May*; fr. *July-Aug.*; new shoots and leaves, *Mar.-Apr.*

Very common on all classes of soil and in all forests, Jub.; Sau.; Ni.; also in Dam.; Seo.; S. Man; Chin. (Sillewani R.); Am.; Ak.; Mel. and no doubt throughout the area.

Of no economic value.

343. **Jasminum auriculatum,** *Vahl.* F. B. I. iii. 600; Br. 451; G. 468; C. ii. 113. Vern. *Jangli johi* (Sau. The vernacular names of this and preceding species are much mixed up.)

A climbing and twining shrub. Leaves 3-foliolate, the 2 lateral very small and often wanting; term. leaflet broadly ovate, 1-2 in. long, mucronate, more or less pubescent. Fls. white, in lax panicled cymes. Fr. globose, black, ¼ in. diam.

Fls. *July-Sep.*; fr. *Dec.*

On sandstone. Sau. (Bassiagond Res.; Garola).

The following non-indigenous species are commonly cultivated in gardens.

344. **Jasminum Sambac,** *Ait.* F. B. I. iii. 591; Br. 449; G. 467; C. ii. 111. Watt iv. 544. Vern. *Mogra* (Hin.).

A shrub, sometimes climbing, with simple opp. ovate glabrous leaves, and fragrant white fls. Known as the Arabian or Tuscan Jasmine. Used in the preparation of Oil of Jasmine.

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345. **Jasminum grandiflorum,** *Linn.* F. B. I. iii. 603; Br. 452; G. 469; C. ii. 115; Watt iv. 542. Vern. *Chameli* (Hin.). Spanish Jasmine.

A climbing or scrambling shrub with opp. pinnate leaves, 2-4 pr. leaflets, and white fls. with a purple tinge.

Supplies most of the Jasmine used in perfumery.

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346. **Nyctanthes Arbor-tristis,** *Linn.* F. B. I. iii. 603; Br. 442; G. 469; C. ii. 115; Watt v. 434; Vern. *Sihau* (Hin.—Jub.; Sau.; Dam.; Ni.); *Harsingur* (Hin.—Jub.; Seo.); *Khirsaru* (Gond.—S. Man.; Chin. (Sillewani R.); *Kharbadi* (Mar.—Yeo.; Ak.); *Khancharu* (Chin., Umreth R.); *Kharassi, parijatak* (Mar.—Am.); *Karsali, siladi* (Kur.—Mel.).

A large shrub with drooping quadrangular branches. Leaves opp. ovate, 2-4 in. long, acuminate, rough and scabrous above, pubescent beneath. Fls. white with an orange centre, fragrant, sessile, in pedunculate bracteate fascicles. Fr. a flat orbicular leathery capsule splitting into 2 cells.

Fls. *Sep.-Oct.*; fr. *Dec.-Feb.*; leaves fall, *Mar.*; leaves renewed, *June.*

Common throughout the area on dry hills; frequently gregarious forming dense thickets.

The young green branches are used for making baskets. The leaves are used as a substitute for sandpaper. The wood yields a good fuel.

347. **Schrebera swietenioides,** *Roxb.* F. B. I. iii. 604; Br. 444; G. 469; C. ii. 116; Watt vi. pt. ii, 488. Vern. *Mokha* (Hin., Mar.—Jub.; Chin.; Seo.; Hosh.; B.C.); *Choti karandi* (Gond.—Seo.); *Ghato* (Hin.—Jub.; Sau.; Dam.); *Ghanta* (S. Man.; Chin.; Sau.); *Jhan* (Kur.—Mel.).

A middle sized tree with ash coloured bark and spreading crown. Leaves opp. imparipinnate; leaflets 7-9,

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ovate, 3-5 in. long, glabrous. Fls. yellow-brown, numerous, in term. many branched 3-chotomous cymes. Fr. a pendulous pear-shaped capsule 2-3 in. long splitting open from apex to base.

Fls. *May-June;* fr. ripens *Dec.-Mar.;* leaves fall, *Feb.-Mar.;* leaves renewed, *May-June.*

Widely spread though not very abundant, throughout the area.

The wood is close grained, strong and durable and is in good demand in the B. C. for building purposes.

SALVADORACEÆ.

348. **Salvadora persica,** *Linn.* F. B. I. iii. 619; Br. 453; G. 476; C. ii. 121; Watt vi. pt. ii, 448. Vern. *Pilu* (Mar.—Ni.).

A small evergreen tree with thick crooked fluted trunk, and drooping branches. Leaves opp., glaucous green, fleshy, ovate to lanceolate, 2-3 in. long. Fls. small, greenish-white, in ax. and term. panicles. Fr. a minute red berry.

Fls. *Nov.-Feb.* Evergreen.

Not common. Ni. (Burhanpur, introduced by the Mahomedans); Mel. Probably indigenous in dry parts of Berar.

The wood is soft and of little use even as fuel. The twigs are used as tooth-brushes. The leaves are a favourite fodder of camels and the fr. is used medicinally.

APOCYNACEÆ.

349. **Carissa spinarum,** *A. D.C.* F. B. I. iii. 631; Br. 455; G. 480; C. ii. 125; Watt ii. 166. Vern. *Karaunda, karonda* (Hin., Mar.—N.C.; B. C.); *Kari* (Pusad R., Yeo.).

A spreading much branched evergreen thorny shrub. Leaves opp., ovate or elliptic, 1-2 in. long, glabrous

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and shining above, pubescent beneath. Fls. small white, star-shaped, fragrant, in few-fld., usually term. 3-chotomous cymes. Fr. a dark purple sub-globose berry ¼ in. diam.

Fls. *Mar.-Apr.* ; fr. ripens *Dec.-Feb.* Evergreen.

Common throughout the area especially on black soil ; often gregarious.

The fr. is eaten and makes good tarts and jelly. The thorny branches are used for fencing fields.

350. **Carissa Carandas,** *Linn.* F. B. I. iii. 630 ; Br. 455 ; G. 479 ; C. ii. 124 ; Watt ii. 165. Vern. *Karaunda* (Hin.).

Similar to preceding, but a larger shrub, leaves larger and glabrous on both surfaces, and fr. ½-1 in. long. Probably the cultivated form of C. spinarum.

Fls. *Mar.-Apr.*; fr. *Dec.-Jan.* Evergreen.

Cultivated near villages, but not very commonly. Jub. ; Bet. ; Seo.

The fr. is eaten as a pickle and makes excellent tarts and preserve.

351. **Holarrhena antidysenterica,** *Wall.* F. B. I. iii. 644 ; Br. 459 ; G. 484 ; C. ii. 133 ; Watt iv. 255. Vern. *Kura* (Hin.—Jub.; Dam.; Chin.; Seo.) ; *Dudhi* (Hin.—Jub. ; Sau. ; Hosh. ; Ni.) ; *Kuraiya* (S. Man.) ; *Samoka* (Gond.—Jub.; Seo.) ; *Kuda* (Mar.—Chin. ; Am.) ; *Kurakat, kurakatto* (Kur.—Mel.) ; *Kali dudhi* (Am.) ; *Indrajau* (Am. ; Chin.) ; *Moka* (Bet.).

A small erect tree. Leaves opp. subsessile, elliptic, or ovate-oblong, 6-12 in. long, glabrous or pubescent, with 10-16 pr. conspicuous sec. nerves. Fls. white, fragrant, in term. corymbose cymes. Stamens not exserted. Fr. shape of a 2-pronged pitchfork, each prong 8-12 in. long, smooth, dark green.

Fls. *Apr.-July* ; fr. *Nov.-Feb.*; leaves fall, *Jan.-Feb.*; leaves renewed, *Apr.-May*.

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Common in all Divisions, frequently as secondary growth in the denser forests.

The wood which is white is in demand for the construction of small articles such as spoons, forks, and notably toys. The bark, leaves, fruits and seeds are used medicinally and are a well known remedy for dysentery.

352. **Wrightia tinctoria,** *A. Br.* F. B. I. iii. 653; Br. 461; G. 486; C. ii. 137; Watt vi. pt. iv, 316. Vern. *Dudhi* (Hin.—Jub.; Sau.; Seo.; Dam.; B. C.); *Kala kudu* (Mar.); *Dudiya* (Bairat, Mel.); *Dehakali* (Ni.; Bet.); *Kura* (Kur.—Mel.); *Kali dudhi* (Chin.). A small tree with light grey bark. Leaves opp. subsessile, elliptic-oblong, 4-8 in. long, shortly acuminate, glabrous or softly tomentose. Fls. white, in lax term. cymes; the cone formed by the stamens standing out above the corolla tube. Sec. nerves not conspicuous. Fr. as in preceding but the two ends of the prongs (follicles) joined at the tips.

Fls. *Mar.-May*; fr. *Nov.* onwards ripening and dehiscing on the tree in *Apr.*; leaves fall, *Dec.-Jan.*; leaves renewed, *Mar.-May*.

Common chiefly on dry sandy soils and hills. Jub.; Sau.; Hosh.; Seo.; Dam.; Chin. (Sillewani R.), and throughout the B. C. There can be little doubt however that it is to be found throughout the N. C.

All specimens I have seen have densely tomentose leaves. The glabrous form has been found by Haines in the Pachmarhi hills, and in the Mel. by Donald.

The wood which is similar to that of *H. antidysenterica* is used for the same purposes. The bark is used in medicine, a decoction being taken internally for stomachic complaints (Deori R., Sau.).

353. **Wrightia tomentosa,** *Roem. & Sch.* F. B. I. iii. 653; Br. 461; G. 487; C. ii. 137; Watt vi. pt. iv., 317. Vern. *Dudhi* (Hin.—Sau.; Ni.; Mel.; Chin.; Am.); *Dudhiya* (Bet.); *Dudhari* (Mel.).

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A small tree abounding in yellow milky juice, with opp. divaricate rough branches. Leaves opp. elliptic, 3-5 in. long, acuminate, softly tomentose, with 8-14 pr. of conspicuous sec. nerves. Fls. pale yellow with orange coronas, in term. tomentose corymbose cymes. Fr. with the two follicles connate into a grooved pendant cylindrical pod, ½ in. diam.

Fls. *Apr.-June*; fr. *Dec.-Feb.*; leaves fall, *Dec.-Jan.*; leaves renewed, *Apr.-May*.

Not nearly so common as *W. tinctoria*. Ni. (Punasa Res.; Kalibhit Res.); Mel. (Bairagarh Res.; Gugamal. R.); Bet.; Am.; Sau. (Patharia Gond Res.); Chin.; Seo.

The wood is used for turning and carved work like that of W. tinctoria.

354. **Vallaris Heynei**, *Spreng.* F. B. I. iii. 650; Br. 462; G. 486; C. ii. 136; Watt vi. pt. iv, 219. Vern. *Dudhibel* (Hin.—Chin.).

A woody climber; old stems with corky bark; branches ash coloured. Leaves opp., elliptic-oblong, 2-4 in. long, shortly acuminate, glabrous. Fls. white, fragrant, saucer-shaped, in ax. corymbs. Fr. green, cylindric, tapering to a blunt point, glabrous, 4-6 in. long.

Fls. *Mar.-July*; fr. *Nov.-Jan.*; new shoots and leaves with the fls.

Apparently not very common. Chin. (Umreth R.); Jub.; Sau. (Ranipura Res.; Rehli R.).

Sometimes cultivated in gardens.

The milky juice is applied to wounds and sores.

355. **Nerium odorum**, *Sol.* F. B. I. iii. 655; Br. 462; G. 487; C. ii. 143; Watt. v. 348. Vern. *Kaner* (Hin.—N.C.; B. C.). The Oleander.

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A large shrub, 8-12 ft. Leaves in whorls of 3, linear-lanceolate, 4-6 in. long, glabrous. Fls. white, pink, or red, in term. corymbs. Fr. linear, 6-9 in. long, green, glabrous.

Fls. *Nov.-Dec.*; fr. *Mar.-Apr.* Evergreen.

Occasionally in rocky beds of streams and ravines. Ni. (Kaneri nala, Chandgarh Res.); Mel.

Extensively cultivated in gardens throughout both circles.

The bark and root are poisonous.

356. **Ichnocarpus frutescens,** *Br.* F. B. I. iii. 669; Br. 464; G. 489; C. ii. 142; Watt iv. 326. Vern. *Dimarbol, kauwarori* (Jub.); *Sanrel, sanrer* (Sau.); *Dudhi* (Chin.).

A large much branched twining shrub, with rusty tomentose branchlets. Leaves opp., elliptic-oblong, 2-4 in. long, glabrous. Fls. small, white, in ax. and term. panicles. Corolla lobes narrow, twisted and bearded. Fr. of two divaricate very slender cylindric follicles 4-6 in. long.

Fls. *Oct.-Dec.*; fr. *Feb.-Apr.*; leaves turn red brown before falling in *Feb.*; leaves renewed, *Mar.-Apr.*

In hedges and dry scrub jungle. Jub.; Sau. (common); Chin. (Umreth R.); and probably in other Divisions.

The twining branches are used for tying bundles, and in the U. P. for basket-making. A decoction of the root is employed as a substitute for Sarsaparilla.

The following non-indigenous species are not uncommonly cultivated in gardens :—

357. **Plumeria acutifolia,** *Poiret.* F. B. I. iii. 641; Br. 458; G. 482; C. ii. 142; Watt vi. pt. i, 297. Vern. *Champa* (Hin.—N. C.; B. C.).

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A small tree with thick branchlets full of milky juice, large oblong acute leaves, and fragrant cream coloured fls. with yellow centre.

Commonly cultivated near temples, the fls. being used as offerings upon the shrines. The plant is a native of Mexico.

358. **Thevetia neriifolia**, *Juss.* Br. 458; G. 481; C. ii. 144; Watt vi. pt. iv, 47. Vern. *Kaner* (Hin.).

A glabrous poisonous shrub with alt. linear, oleander-like leaves, yellow fragrant fls., and sub-globose fr.

The bark is occasionally used as a febrifuge; the seeds give a yellow oil used in medicine.

359. **Allamanda cathartica**, *Linn.* Br. 456; G. 478; C. ii. 144; Watt i. 168.

An evergreen scandent shrub with whorled leaves and large handsome yellow fls.

Common in gardens especially in Jub.

360. **Tabernæmontana coronaria**, *Willd.* F. B. I. iii. 646; Br. 460; G. 485; C. ii. 134; Watt vi. pt. iii, 401.

An evergreen glabrous shrub with opp. elliptic-oblong, acuminate leaves, and pure white fls. fragrant at night.

Indigenous in the sub-Himalayan tract.

361. **Rauwolfia canescens**, *Linn.* G. 481; C. ii. 128.

A small shrub with whorled ovate-oblong leaves, small, white fls., and dark red juicy berries.

Cultivated in gardens, and run wild, Sau.

A native of the West Indies.

ASCLEPIADACEÆ.

With few exceptions these are climbers with opp. leaves and milky juice. The arrangement of the stamens is peculiar and the various genera are classified thereby; broadly the stamens and anthers are united into a staminal tube round the style, and provided with variously shaped appendages. The fr. consists of two so-called follicles of various shapes, with flat seeds surmounted by a dense brush of hairs.

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Cryptolepis Buchanani, *Roem. & Sch.* F. B. I. iv. 5; Br. 467; G. 490; C. ii. 147; Watt ii. 624. Vern. *Dudhi* (Hin.—Jub.; Sau.; Hosh.; Chin.; Seo.); *Kali dudhi* (Hin.—Dam.; Sau.); *Kauwarori* (Jub.); *Badisar* (Jub.; S. Man.); *Itikur, dudh mogri* (S. Man.); *Kaovel, kawavel* (Mar.—Bul.; Ak.; Yeo.); *Nagbel* (Ni.; Gugamal R., Mel.); *Karbel, kalibel* (Mel.).

A large twining shrub; bark of young shoots purplish-red peeling off in papery flakes. Leaves opp. elliptic-oblong, 3-5 in. long, shining above, whitish beneath; sec. nerves numerous, at right angles to midrib uniting in an intramarginal nerve. Fls. small, pale yellow, in ax. cymes. Follicles 2-4 in. long, green, straight, divaricate, tapering to a blunt point.

Fls. *May-July*; fr. ripens *Dec.-Feb.* Evergreen.

Common throughout the area especially in dry localities. In some localities such as Mel. it is a forest pest strangling Teak coppice shoots and seedlings and is very difficult to eradicate.

The leaves are eaten by goats—(Donald).

363. **Hemidesmus indicus,** *R. Br.* F. B. I. iv. 5; Br. 468; C. ii. 146; Watt iv. 219. Vern. *Anantmul* (Hin.—Sau.); *Dudhibel* (Hosh.; Chin.); *Gagasvel* (Mel.); *Anantvel* (Mar.—Berar); *Lahan* (Ak.); *Kaolvel* (Yeo.). Indian Sarsaparilla.

A perennial twining shrub. Leaves opp. variable from elliptic-oblong to linear, 2-4 in. long, apiculate, frequently with a white central streak above, and pale beneath. Fls. small, green outside, purple inside, clustered in the axils of the leaves. Follicles cylindric, 4-6 in. long, smooth, tapering to a point at the apex.

Fls. *Sep.-Oct.*; fr. *Dec.-Feb.* Evergreen.

Common in hedges and forest. Jub.; Sau.; Chin. (Sillewani R.); Seo.; Hosh.; Mel. (at low elevations);

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Ak.; Ni.; Yeo. (Darwha R.); and probably throughout the area.

The root is commonly used as a substitute for Sarsaparilla, as a tonic and alterative.

364. **Calotropis gigantea**, *Br.* F. B. I. iv. 17; Br. 471; G. 491; C. ii. 151; Watt ii. 34. Vern. *Akaua* (Hin.—Jub.; Seo.; Chin.); *Akau* (Hin.—Chin.; Dam.; Sau.; Ni.; Bet.); *Akawan* (S. Man.); *Mudar, ak, akra, rui* (Mar.—B. C.); *Rui* (Mar.—Seo.).

A tall shrub, 8-10 ft. with yellowish-white bark. Young shoots, leaves and inflorescence clothed with soft white woolly tomentum. Leaves opp., obovate, 4-8 in. long, narrowed into a cordate base, glaucous green. Fls. pale-mauve or white, in lateral cymes; buds ovoid. Follicles 3-4 in. long, broad, fleshy, recurved, green.

Fls. *Nov.-Mar.*; fr. *Jan.-May.* Evergreen.

Common throughout the area on waste land, both on black cotton soil and along sandy river banks.

The bark of the stem yields a valuable fibre. The milky juice is used medicinally. The floss from the seeds is used for stuffing pillows. The powdered root is used in medicine.

365. **Calotropis procera**, *R. Br.* F. B. I. iv. 18; Br. 472; G. 491; C. ii. 152; Watt ii. 49. Vern. (Same as for preceding).

A shrub similar to last, but usually smaller. Leaves more stiffly coriaceous and smaller than those of preceding. Fls. purplish-mauve; buds hemispherical. Fr. as in preceding.

Fls. *Dec.-Feb.*; fr. *Feb.-Apr.* Evergreen.

This is probably as common throughout the area as *C. gigantea*, though it has only been reported from a few Divisions. Jub.; Sau.; Dam.; Ni.; Mel. In the Mel. it is not so common as preceding.

The plant is used for the same purposes as C. gigantea.

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366. **Oxystelma esculentum,** *R. Br.* F. B. I. iv. 17 ; C. ii. 152 ; Watt v. 675. Vern. *Hirankhuri* (Sau.).

A perennial twining herb. Leaves opp. linear or linear-lanceolate, 2-4 in. long, acute, glabrous. Fls. large, very handsome, the corolla saucer-shaped, pale rose colour veined with purple inside, in pedunculate lateral cymes. Follicles ovoid-lanceolate, 1½-2½ in. long, tapering to a point.

Fls. *July-Sep.* ; fr. *Aug.-Oct.* ; the stems die down in the cold weather and reappear with the rains.

In hedges. Sau. (Ratnari) ; Ni. (Khandwa) ; Chin. (Sillewani R.).

The milky juice and roots are used medicinally. The fr. is said to be eaten in Sind.

367. **Daemia extensa,** *R. Br.* F. B. I. iv. 20 ; Br. 469 ; C. ii. 155 ; Watt iii. 3. Vern. *Dudhi, dudhi bel* (Hin.—Jub. ; Sau. ; Chin. ; Seo. ; Hosh. ; Ni.) ; *Utaranavel* (Mar.—Ak.).

A perennial hairy fœtid climber. Leaves opp. orbicular, 2-4 in. long, acuminate, base deeply cordate. Fls. greenish-yellow to white, in drooping panicles at the end of a long peduncle, arising from between the leaf petioles. Follicles lanceolate, reflexed, clothed with long soft spines.

Fls. *Aug.-Jan.* (several times) ; fr. *Oct.-Feb.* ; the stems die down about *Feb.* and reappear with the rains.

Extremely common in village hedges. No doubt found in all Divisions. Specimens obtained from Jub. ; Sau. ; Chin. (Umreth R.) ; Hosh. ; Seo. ; Ni. ; Ak.

The stems yield a fine and strong fibre which deserves attention. The plant has emetic and expectorant properties and is used by natives in the diseases of children.

368. **Holostemma Rheedii,** *Wall.* F. B. I. iv. 21 ; Br. 468 ; C. ii. 156 ; Watt iv. 261. Vern. *Kokrera, kopdera* (Sau.) ; *Morewan* (Mel. ; Bul.) ; *Palkhevel* (Ak.).

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A large glabrous twining shrub. Leaves opp. ovate, 3-5 in. long, acuminate. Fls. fragrant, ovoid, purple inside, frosted-pale pink outside, in few-fld. cymes, on 1-2 in. long peduncles arising close to the base of the leaf-stalk. Follicles broad, thick, ovoid, beaked at the apex.

Fls. *July-Sep.*; fr. *Nov.-Jan.*

In hedges and climbing over trees in dry scrub jungle. Sau. (Abchand Res.); Hosh. (Malni); Ni. (Khandwa); Ak.; Bul.; Mel.

The leaves and fls. are eaten. The root is used in medicine as an application for ophthalmia.

369. **Gymnema sylvestre,** *R. Br.* F. B. I. iv. 29; Br. 469; G. 492; C. ii. 160; Watt iv. 189. Vern. *Phulkat* (Sau.).

A stout woody pubescent climber, frequently covering the tops of tall trees. Leaves opp., ovate to elliptic, 1-2 in. long, pubescent. Fls. small, yellow, in short lateral umbellate cymes. Follicles lanceolate 2½-3 in. long, tapering to a point.

Fls. *June-Aug.*; fr. *Jan.-Apr.*; leaves fall, *Feb.-Mar.*; leaves renewed, *Apr.*

Not uncommon in open forest, chiefly on sandstone. Sau. (Gharakota Res.); Hosh. (Pachmarhi; Malni).

The leaves if chewed have the peculiar property of destroying the taste for saccharine substances. The fr. is used in medicine for sore eyes. The root is employed by natives as a remedy for snake-bite.

370. **Tylophora rotundifolia,** *Ham.* F. B. I. iv. 43; C. ii. 163.

A perennial twiner. Leaves broadly ovate, 1-2½ in. long, glabrous above, pubescent beneath. Fls. small in many fld. umbellate cymes on short peduncles from between the petioles. Follicles green, ovoid, 2-3 in. long, tapering towards the apex, grooved down the centre.

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Fr. *Oct.*

Mel. ; Seo. (Khurai R.) ; Chin. (Sillewani R.).

371. **Marsdenia tenacissima,** *W. & A.* F. B. I. iv. 35 ; Br. 470 ; G. 492; C. ii. 165 ; Watt v. 188. Vern. *Safed dudhi* (Sau).

A stout woody twiner, with grey corky bark ; branchlets pubescent. Leaves opp. broadly ovate, 4-7 in. long, shortly acuminate, velvety pubescent, base deeply cordate. Fls. green, in dense interpetiolar, drooping pedunculate, compound cymes. Follicles ovate-lanceolate, 4-6 in. long, velvety, grooved on one side.

Fls. *July-Sep.* ; fr. *Nov.-Feb.*

Not common. Jub. ; Sau. (Abchand Res. ; Jallandhar Res.).

The bark of the stem yields a valuable fibre of great strength.

372. **Dregea volubilis,** *Benth.* (Syn. Marsdenia volubilis, *Cooke*). F. B. I. iv. 46 ; Br. 468 ; G. 493 ; C. ii. 166 ; Watt iii. 193. Vern. *Dudhi* (Sau. ; Ak. ; Ni.) ; *Bakar* (Ak. ; Ni.) ; *Ghaidudhivel* (Ak. ; Mel.) ; *Piwarbel* (Chichona, Mel.).

A large twining shrub ; branches ash coloured, lenticellate. Leaves opp., ovate, 2½-6 in. long, acuminate, slightly pubescent, often glandular at base of midrib above. Fls. bright green, ½ in. across, in. drooping interpetiolar, pedunculate umbels. Follicles cylindric, 3-4 in. long, tapering to a blunt point, covered with ferruginous tomentum.

Fls. *Apr.-May* (Ni.) ; *May.-July* (Sau.) ; fr. *Sep.-Mar.* ; leaves fall, *Feb.-Mar.* ; leaves renewed, *Apr.-May*.

Common in open scrub jungle ; Sau. (common) ; Chin. (Umreth R.) ; Ni. ; Ak. ; Mel. and probably in all Divisions.

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The leaves are eaten in Ceylon. The plant yields a strong fibre.

373. **Pergularia pallida,** *W. & A.* F. B. I. iv. 38 ; Br. 470 ; G. 493 ; C. ii. 164. Vern. *Bisauthia, dudhibel* (Sau.) ; *Jibti* (Chin.).

A large twining shrub, bark of old stems corky, young stems pubescent. Leaves opp., ovate, cordate, 2-4 in. long, acuminate, glabrous. Fls. pale yellow, in umbellate cymes, on short lateral peduncles, corolla inflated at the base. Follicles usually solitary, lanceolate, 3-4 in. long, tapering to a blunt point, glabrous.

Fls. *June-Aug ;* fr. *Nov.-Jan.*

Not uncommon in hedges and open forest, Sau. (Ranipura Res. ; Gharakota. Res.) ; Chin., (Sillewani R.) ; Ni. (Khandwa) ; Mel. ; Hosh. (Bori Res.).

The fr. is said to be eaten.

374. **Leptadenia reticulata,** *W. & A.* F. B. I. iv. 63 ; Br. 472 ; G. 493 ; C. ii. 172 ; Watt iv. 630. Vern. *Dudhi.*

A twining shrub with deeply cracked corky bark ; branchlets hoary pubescent. Leaves opp. ovate, 1½-3 in. long, acute, base rounded, glabrous. Fls. small, greenish-yellow, in many fld. globose cymes, on very short peduncles. Follicles sub-woody, 2½-3 in. long tapering into a shortly curved beak.

Fls. *June-July ;* fr. *Dec.-Feb.*

Apparently not very common. Chin. (Sillewani R.) ; Mel. (Dehgaon) ; Ni. (Khandwa).

The leaves and tender shoots are said to be eaten in times of scarcity.

375. **Ceropegia bulbosa,** *Roxb.* F. B. I. iv. 67 ; C. ii. 176 ; Watt ii. 262. Vern. *Sanbolbagiya* (Sau.) ; *Gakerkand* (Ni.) ; *Malandru* (Chin.).

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A perennial herbaceous twiner, with a turnip-shaped tuberous root. Leaves variable—var. **bulbosa** proper with stalked fleshy, orbicular leaves 2-3 in. long; var. **Lushii** with sessile linear leaves 4-8 in. long. Fls. greenish, corolla bottle-shaped, inflated at the base, the lobes hairy and connate at the tips, dark purple inside. Follicles linear, 4 in. long, tapering to an acute apex, glabrous.

Fls. and fr. *July-Oct.*; stems and foliage appear in the rains and die down in the cold season.

In hedges but not very common. Sau. (Marpani); Chin. (Sillewani R.); Ni. (Khandwa).

The leaves and tubers are eaten as a pot-herb.

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376. **Cryptostegia grandiflora**, *R. Br.* F.B.I. iv. 6; Br. 466; G. 490; C. ii. 180; Watt ii. 625.

A large climber with glossy elliptic leaves 3-4 in. long, large showy rose-coloured fls. and boat-shaped follicles.

Fls. *July-Sep.*; fr. *Mar.-May.*

A native of Africa, commonly cultivated in gardens and run wild in Sau., Civil Station.

LOGANIACEÆ.

377. **Strychnos potatorum**, *Linn. f.* F. B. I. iv. 90; Br. 474; G. 498; C. ii. 186; Watt vi. pt. iii, 382. Vern. *Nirmali* (Hin., Mar.—Jub.; Chin.; Seo.; Ni.; Ak.; Yeo.); *Khaia* (Jub.); *Asthomri* (Gond.—Bet.). The Clearing Nut tree.

A small tree with dark brown deeply cracked bark. Leaves opp. almost sessile, ovate or elliptic, 2-3 in. long, shining, 3-5 nerved from near the base. Fls. white, fragrant, in lateral sessile cymes. Fr. a globose black berry, ½ in. diam.

Fls. *Apr.-May*; fr. *Oct.-Feb.* Evergreen.

Not common. Jub. (in Sal forest); Seo.; Ni. (Kirgaon

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Res.); Yeo. (near Pus river); Bet.; Ak. (Balapur R.); Chin. (Sillewani R.).

The seeds are used for clearing muddy water. They are also used in medicine and the pulp of the fr. is eaten.

378. **Buddleia asiatica,** *Lour.* F. B. I. iv. 82; Br. 475; G. 495; C. ii. 183; Watt i. 546.

A large shrub; young branches tomentose. Leaves opp. lanceolate, 3-5 in. long, acute, entire or serrulate, glabrous above, clothed beneath with a whitish mealy tomentum. Fls. white, fragrant, sessile, in dense term. and ax. panicled spikes. Fr. a small ovoid capsule ½ in. long.

Fls. *Dec.-Feb.*; fr. *Mar.* Evergreen.

Apparently very scarce. On banks of nalas and rivers Jub.—(Hole). Mel. (near streams in the Tapti valley —[Donald]). Ni. (Sakharghat—[Duthie]).

BOROGINACEÆ.

379. **Cordia Myxa,** *Linn.* F. B. I. iv. 136; Br. 478; G. 500; C. ii. 199; Watt ii. 563. Vern. *Lasora* (Hin.—Sau.; Chin.; Ni.; Am.); *Lasara* (S. Man.); *Rasalla* (Hin.—Jub.; Seo.; Dam.; S. Man.); *Rete* (Gond.—Seo.; Chin.); *Dohar* (Baiga—S. Man.); *Gondi* (Hin.—Jub.; Ni.); *Gondan* (Mar.—Yeo.; Am.); *Bhokar* (Mar.); *Silu* (Kur.—Mel.).

A small or middle sized tree, bark brown, with shallow wrinkles and furrows. Leaves alt. orbicular-elliptic or obovate, often repand-dentate, 2-5 in. long, base cuneate, usually 3-nerved from the base. Fls. small, white, in lax. term. and ax. cymes Fr. ovoid, ½-1 in. long, yellow or pinkish, shining, with very viscous pulp.

Fls. *Mar.-Apr.*; fr. *June-Aug.* Evergreen (?).

In all Divisions, but whether truly wild throughout the area seems doubtful. Not wild, Jub.—(Hole). Frequently planted in avenues and round villages.

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The wood is fairly strong and is used in other parts of India for boats, well curbs and agricultural implements. The bark is made into ropes. The ripe fr. is eaten, and is used in native medicine. The viscid pulp is used as birdlime.

Donald reports from the Mel. a small tree with pale bark, and large broadly ovate leaves with repand margins, and 3-5 sub-basal strong nerves with 1-2 pr. of nerves below these often decurrent into the petiole, covered with cystoliths above. He considers this to be **Cordia obliqua**, *Willd.* (Syn. C. latifolia, Roxb.). The matter requires further investigation (*vide* Haines' List of Southern Circle, Ind. Forester, Vol. XL, No. 7). As Brandis and Cooke combine it with *C. myxa* and I have seen no specimens of it I leave it an open question.

380. **Cordia Macleodii,** *H. f. & Th.* F. B. I. iv. 139 ; Br. 479 ; G. 502 ; C. ii. 200 ; Watt ii. 563. Vern. *Dhengan, dahyan* (Hin.—Jub.; Dam.; S. Man.); *Daiyar, deyar* (Sau.; Chin.) ; *Dehwan*(S. Man.) ; *Daiwas* (Mar.—Chin.) ; *Dahipalas* (Mar.—B.C.) ; *Teliasag* (Ni.) ; *Laurikassamar* (Kur.—Mel.) ; *Dhaiyan* (Kathali, Mel.).

A small or middle sized tree with smooth light grey bark. Branchlets, underside of leaves, and inflorescence clothed with a dense grey or tawny tomentum. Leaves alt., broadly ovate-cordate, 4-8. in. long, 3-5-nerved at the base, upper surface rough but shining. Fls. white, middle sized, in dense lateral nearly sessile cymes. Fr. yellowish, ovoid, ½-¾ in. long.

Fls. *Mar.-Apr.* ; fr. *May-June.* Nearly evergreen ; leaves renewed, *Apr.-May.*

Common in all Divisions.

The wood is of considerable value. It is hard, tough and easily worked, and is used for furniture and agricultural implements. In Kanara largely used for the construction of carts.

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381. **Cordia Rothii**, *R. & S.* F. B. I. iv. 138; Br. 480.; G. 501; C. ii. 202; Watt ii. 565. Vern. *Gondi* (Hin.—Sau.).

A middle sized tree; bark brownish grey with deep longitudinal furrows. Leaves nearly opp., oblanceolate-oblong, 3-4 in. long, obtuse, rough above. Fls. small, white, in lax, ax. and term. pedunculate cymes. Fr. ovoid, ½ in. long, yellow or reddish-brown, supported by the saucer-shaped calyx.

Fls. *Apr.-June*; fr. *Aug.-Sep.*

Occasionally planted near villages. Sau. (Rehli). It should be found in the dry districts of Berar, but I have seen no specimens.

The wood is a valuable one. In Sind it is used for building. The fr. is eaten and pickled. A decoction of the bark is used as a gargle.

382. **Ehretia laevis**, *Roxb.* F. B. I. iv. 141; Br. 481; G. 503; C. ii. 203; Watt iii. 203. Vern. *Datranga* (Hin.—Jub.; Seo.); *Chamror, tamoiya* (Sau.); *Chinor* (Ni.); *Bhoi umbar* (Mel., Katkali).

A small tree with light grey smooth bark. Leaves alt. elliptic, rarely obovate, 3-6 in. long, glabrous. Fls. white, sessile, in much branched ax. and term. cymes. Fr. a small nearly 2-lobed black berry.

Fls. *Jan.-Mar.*; fr. *Apr.-June*; leaves shed, *Jan.-Feb.*; leaves renewed, *Apr.*

Fairly common in hilly forest and near nalas. Jub.; Sau.; Seo.; Chin. (Umreth R.); S. Man.; Ni. (Piplod R.); Mel. (Gugamal R.), and probably throughout the area.

The wood is tough and durable but is little used. The fr. is eaten, and the leaves used for fodder.

A variety **aspera** with smaller narrow leaves tomentose beneath is sometimes found.

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383. **Ehretia acuminata,** *R. Br.* F.B.I. iv. 141 ; Br. 481 ; G. 503.

A middle sized tree. Leaves alt. elliptic-oblong, 4-6 in. long, acuminate, serrate, almost glabrous. Fls. white, fragrant, in large ax. and term. erect panicles. Fr. nearly globose $\frac{1}{8}$ in. diam., red when ripe.

Fls. *Feb.-Apr.;* fr. *Apr.-May.* Evergreen.
Scarce. S. Man. (Banjar Valley).

The wood is used in N. India for building and agricultural implements. The fr. is eaten.

384. **Rhabdia lycioides,** *Mart.* F. B. I. iv. 145 ; Br. 482 ; G. 504 ; C. ii. 205. Vern. *Sawariya* (Ni.) ; *Phanbidi* (Mel.) ; *Dantratchu* (Sau.).

A small shrub 2-4 ft. with erect or prostrate branches. Leaves linear or oblanceolate, $\frac{1}{2}$-1 in. long, often crowded on short arrested branchlets. Fls. small pink, usually 2-3 at the ends of the short branchlets. Fr. a small orange-red, fleshy drupe.

Fls. *Oct.-Jan.;* fr. *Nov.-Feb.* Evergreen.

Common in river-beds. Jub.; Sau.; S. Man.; Ni.; Mel. and probably in all Divisions.

CONVOLVULACEÆ.

385. **Rivea ornata,** *Choisy.* F. B. I. iv. 183; Br. 484 ; G. 506 ; C. ii. 254 ; Watt vi. pt. i, 558. Vern. *Phang.*

A woody climber with silky stems. Leaves alt. orbicular-cordate, broader than long, obtuse silky-hairy beneath. Fls. large, white, fragrant, salver-shaped with a long tube ; peduncles 3-7 fld. Sepals ovate-lanceolate, acute. Fr. a chestnut-brown sub-globose shining capsule $\frac{3}{4}$ in. diam.

Fls. *Aug.-Sep.;* fr. *Nov.-Dec.*

In hedges but not common. Ni. ; Mel.

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386. **Rivea hypocrateriformis,** *Choisy.* F. B. I. iv. 184; Br. 484; G. 506; C. ii. 254; Watt vi. pt. i, 557. Vern. *Phang* (Hin., Mar.—N. C.; B. C.); *Phangi, phangvel* (B. C.).

A large climber similar to preceding, but may be distinguished by the leaves being seldom broader than long, by the ovate-obtuse smaller sepals and the peduncles being 1-2 fld. Fr. as in preceding. The fls. open at night, and close during the day.

Fls. *Aug.-Sep.*; fr. *Nov.-Dec.*

Common in hedges and open scrub jungle. Jub.; Sau.; Dam.; Seo.; Chin. (Sillewani R.); Ak.; Bul.; Ni.; Mel. and probably in all Divisions.

The leaves and young shoots are eaten as a vegetable.

387. **Argyreia sericea,** *Dalz.* F. B. I, iv. 188; Br. 484 C. ii. 256. Vern. *Kutla* (Sau.).

A hairy twiner. Leaves alt. ovate-cordate, 3-6 in. long, silky silvery-white beneath, hairy above. Fls. rose-lilac, in capitate cymes surrounded by large hairy bracts. Fr. globose, ½ in. diam., yellow.

Fls. *Aug.-Sep.*; fr. *Oct.-Nov.*

In hedges, Sau. (Rangir); Seo.; Chin. (Sillewani R.); Hosh. (Bori R.); Ni.; Mel.

388. **Argyreia speciosa,** *Sweet.* F. B. I. iv. 185; Br. 485; G. 506; C. ii. 255; Watt i. 310. Vern. *Sanandsok* (Sau.). The Elephant creeper.

A large climber, branches, underside of leaves and inflorescence, silvery-white tomentose. Leaves ovate-cordate, 3-12 in. long, glabrous above. Fls. rose purple, in pedunculate corymbs. Peduncles 3-12 in. long. Fr. globose, ¾ in. diam.

Fls. *Aug.-Sep.*; fr. *Oct.-Nov.*

Doubtfully wild in this area. Not uncommonly planted in villages. Sau. (Rehli)

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The root is regarded as useful in rheumatic affections.

389. **Lettsomia setosa,** *Roxb.* F. B. I. iv. 194 ; Br. 486 ; C. ii. 260. Vern. *Budhwara* (Sau. ; Dam. ; Seo. ; Chin.) ; *Bhaisvel, bhaislae* (Mar.—Berar); *Bhaisela, bhaisbel* (Ni.). A strong twiner, young stems strigose-hairy. Leaves alt, ovate-cordate, 3-6 in. long, acute, sparsely hairy on both surfaces. Fls. rose-coloured, hairy, in corymbose cymes on peduncles 2-8 in. long. Fr. ovoid, red.

Fls. *Oct.-Dec.* ; fr. *Dec.-Feb.*

Common in hedges. Sau. ; Dam. ; Seo. ; Chin. (Amarwara R.) ; Am. ; Bul. ; Ak. ; Ni. ; Mel. ; probably in all Divisions.

The leaves are eaten as a vegetable.

390. **Ipomæa hederacea,** *Jacq.*, var. typica. F. B. I. iv. 199 ; C. ii. 252 ; Watt iv. 485. Vern. *Kala-danah* (the seed).

An annual hairy twiner. Leaves alt., ovate-cordate, 3-lobed, long petioled. Fls. bright blue turning to rose-purple when faded. Peduncles 1-5 fld. Fr. ovoid, ⅓ in. long, 3-celled, smooth.

Fls. *Sep.-Oct.* ; fr. *Nov.-Dec.*

Common in hedges and round villages both wild and cultivated. Ni. (Asirgarh) ; Mel. ; Sau. ; Jub. Said to be an American plant naturalised in the East.

The seeds are used in medicine as a purgative.

391. **Ipomæa muricata,** *Jacq.* F. B. I. iv. 197 ; C. ii. 253 Watt iv. 487.

A herbaceous twiner with muricate stems. Leaves ovate-cordate, 3-6 in. long, acute, glabrous. Fls. large, rose-purple ; peduncles 1-5 fld. Fr. globose, ½ in. diam., apiculate. Top of peduncle much swollen in fruit.

Fls. *Sep.-Nov.* ; fr. *Dec.-Jan.*

Near villages, Mel.

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392. **Ipomæa calycina,** *Benth.* F. B. I. iv. 201 ; C. ii. 242.

Annual twiner, sparingly clothed with long spreading hairs. Leaves ovate-cordate, acuminate, 2-3 in. long. Fls. 1-3, small, white, the outer sepals sagittate. Fr. ovoid, $\frac{1}{3}$ in. long, pointed, glabrous.

Fls. *Oct.*

In hedges. Ni. (Khandwa).

393. **Ipomæa pentaphylla,** *Jacq.* F. B. I. iv. 202 ; C. ii. 239.

A twining annual ; hairy. Leaves digitate ; leaflets 5, broadly lanceolate, acuminate. Fls. white in few-fld. racemose cymes ; peduncles 1-4 in. long. Sepals enlarged in the fr., fulvous-hairy. Fr. ovoid, $\frac{1}{4}$ in. long, glabrous.

Fls. *Sep.-Oct.* ; fr. *Nov.-Dec.*

Ni. (Singaji R.) ; Mel.

394. **Ipomæa pes-tigridis,** *Linn.* F. B. I. iv. 204 ; C. ii. 250 ; Watt iv. 488. Vern. *Panch-patri* (Sau.).

A twining herb, clothed with long spreading hairs. Leaves sometimes entire, but usually palmately 5-9 lobed, 2-4 in. diam., hirsute on both surfaces. Fls. pale pink in pedunculate heads surrounded by large ovate-oblong hairy bracts. Fr. globose, $\frac{1}{3}$ in. diam., glabrous, papery.

Fls. *Sep.-Nov.* ; fr. *Nov.-Dec.*

Common in hedges and grass lands. Ni ; Mel. ; Sau. (Chitoli) ; Seo. ; Chin. (Sillewani R.).

395. **Ipomæa sepiaria,** *Koen.* F. B. I. iv. 209 ; C. ii. 246 ; Watt iv. 491.

A perennial usually glabrous twiner. Stems purple when young. Leaves ovate-cordate, 1-3 in. long, acute, glabrous. Fls. in pedunculate umbellate cymes.

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Corolla white, purple inside the tube. Fr. ovoid, $\frac{1}{3}$ in. long, glabrous.

Fls. *Aug.-Nov.*; fr. *Nov.-Jan.*

Common in hedges. Jub.; Ni.; Mel. (at low elevations).

396. **Ipomæa petaloidea,** *Choisy.* F. B. I. iv. 212; Br. 488.

A large glabrous twiner. Leaves ovate, 5 in. long, base rounded, the upper usually lanceolate. Fls. in ax. racemes. Corolla large, yellow, shaggy outside. Fr. ovoid, $\frac{1}{2}$ in. long.

Fls. *Dec.-Jan.*

Scarce. Mel. (Gugamal R.).

397. **Ipomæa Turpethum,** *Br.* F. B. I. iv. 212; Br. 488; C. ii. 240; Watt iv. 493. Vern. *Nisod, tidhara* (Sau.); *Randa ratala* (Yeo.).

An extensive perennial twiner, stems quadrangular, winged. Leaves ovate, 2-4 in. long, mucronate, base truncate, slightly pubescent on both surfaces. Fls. in few-fld ax. cymes. Corolla large, white. Sepals very much enlarged in the fr. and papery, enclosing the globose capsule $\frac{1}{2}$ in. diam.

Fls. *Aug.-Oct.*; fr. *Nov.-Jan.*

In hedges in open country. Jub.; Sau. (common); Yeo. (Basim); and probably in other Divisions.

The root is used in medicine as a purgative and is known as Indian jalap.

The following species are commonly cultivated in gardens and occasionally found as escapes :—

398. **Ipomæa Bona-nox;** *Linn.* F. B. I. iv. 197; Br. 487; C. ii. 252; Watt iv. 483. The Moon flower.

A large twiner with pure white fragrant fls. opening after dark and fading the next morning.

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Ipomæa coccinea, *Linn.* F. B. I. iv. 199; C. ii. 261.

A subscandent shrub with ovate-cordate acute leaves, and lax. cymes of crimson fls. A native of tropical America.

Fls. *Nov.-Jan.*; fr. *Jan.-Feb.*

Common in hedges planted and as an escape, Jub.; Sau.; Mel.

400. **Ipomæa Quamoclit,** *Linn.* F. B. I. iv. 199; C. ii. 261.

A twining glabrous annual, with pinnate leaves with numerous filiform segments, and bright red fls. A native of tropical America.

Fls. *Oct.-Nov.*

401. **Ipomæa palmata,** *Forsk.* (Syn. T. pulchella, Roth.). F. B. I. iv. 214; C. ii. 250. The Railway creeper.

A perennial twiner with palmately 5-7 lobed leaves, and pale-purple fls. Fls. most of the year. Indigenous in the Bombay Presidency. Common as an escape, Mel.

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402. **Convolvulus arvensis,** *Linn.* F. B. I. iv. 219; C. ii. 234; Watt ii. 518. Vern. *Hiranchi* (Sau.); *Chandbel* (Mel.).

A trailing or twining herb; root-stock creeping. Leaves alt. lanceolate-hastate, 1-2½ in. long, glabrous. Fls. white or pink; peduncles ax. 1-3 fld. Fr. globose, ¼ in. diam., glabrous.

Fls. *Dec.-Feb.*; fr. *Jan.-Mar.*

A common weed in cultivated fields in the cold weather. Throughout the area.

403. **Convolvulus parviflorus,** *Vahl.* F. B. I. iv. 220; C. ii. 235; Watt ii. 519.

A twiner with sub-woody stems, slightly pubescent. Leaves ovate, 1½-3 in., acuminate, base slightly cordate. Fls. small, white or pale-pink, in ax. pedunculate umbellate cymes. Fr. globose, ½ in. diam., glabrous papery.

Fls. *Oct.-Nov.*; fr. *Dec.-Jan.*

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Not uncommon in hedges. Sau. (Rehli R.) ; Ni.

404. Convolvulus flavus, *Willd.* F. B. I. iv. 219.

A small herbaceous twiner with hairy stems. Leaves hastate, 1-3 in. long, pubescent. Fls. small, white, ax. solitary. Fr. ovoid, $\frac{1}{3}$ in. long.

Fls. *Oct.*

Common on coarse grass lands, Chikalda Mel., 3,500 ft.

405. Porana paniculata, *Roxb.* F. B. I. iv. 222 ; Br. 487 ; G. 507 ; C. ii. 227.

A large climber, branches clothed with soft grey pubescence. Leaves ovate-cordate, 3-5 in. long, acuminate, softly grey-tomentose beneath, 5-7 nerved from the base. Fls. small, white, numerous, in large ax. and term. drooping panicles. Fr. globose, $\frac{1}{5}$ in. diam., hairy, surrounded by 3 enlarged sepals.

Fls. *Oct.-Jan.* ; fr. *Dec.-Feb.*

In moist localities, not very common. Jub. ; Sau. (Jallandhar Res. ; Branj Nadi) ; Chin. (Umreth R.) ; Seo. (Nerbudda R.).

406. Cuscuta reflexa, *Roxb.* F. B. I. iv. 225 ; C. ii. 224 ; Watt ii. 671. Vern. *Amarbel* (Hin.—Jub. ; Sau. ; Chin. ; Seo. ; Ni. ; Hosh.).

A leafless twining parasitic annual, consisting of pale-yellow fleshy stems trailing over and sometimes completely covering bushes and the crown of trees. Fls. small, white, bell-shaped, solitary or in short racemes. Fr. depressed-globose, fleshy, $\frac{1}{4}$ in. diam.

Fls. *Nov.-Jan.* ; fr. *Dec.-Feb.* Dies down in the hot weather.

Fairly common, Jub. ; Sau. ; Chin.; Seo. ; Ni. ; Hosh. (Pachmarhi) ; in plains, western Mel., and probably in all Divisions.

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The seeds are used medicinally in the Punjab as an alterative.

SOLANACEÆ.

407. **Solanum indicum,** *Linn.* F. B. I. iv. 234; Br. 489; G. 507; C. ii. 266; Watt vi. pt. iii, 258. Vern. *Dorli* (Ak.; Bet.); *Belwangen* (Ak.); *Bhatkatiya* (Bet.); *Ringni* (Mel.; Bul.).

A much branched very prickly undershrub, 1-4 ft. Leaves alt., sinuate to pinnatifid, 1-5 in. long, densely woolly beneath, prickly on the midrib. Fls. bluish-purple, with conspicuous yellow stamens, in racemose cymes. Fr. a globose dark yellow berry, ⅓ in. diam.

Fls. *Aug.-Oct.*; fr. *Nov.-Dec.*

Fairly common, Sau.; Mel.; Ni.; Ak.; Bul.; Bet.; Chin. (Amarwara R.).

408. **Withania somnifera,** *Dunal.* F. B. I. iv. 239; Br. 490; G. 508; C. ii. 271; Watt vi. pt. iv, 311.

An erect undershrub 1-5 ft.; branches clothed with grey hoary tomentum. Leaves sub-opp., ovate, 2-5 in. long, pubescent. Fls. greenish-yellow, in sessile umbellate cymes. Fr. a red berry, ¼ in. diam., enclosed in the inflated papery calyx.

Fls. *Jan.-Mar.*; fr. *Feb.-Apr.*

In hedges, Jub., Mel. (Gugamal R.). Should be common in the drier areas.

The root is used medicinally in the Punjab.

409. **Datura Stramonium,** *Linn.* F. B. I. iv. 242. Vern. *Safed dhatura, dhatura, dhotra* (Hin.—N.C.; B.C.).

A large coarse annual. Leaves alt. ovate, sinuate or toothed, 4-7 in. long. Fls. large, white, trumpet-shaped, solitary. Fr. a deeply 4-valved sub-globose capsule covered with soft spines.

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Fls. *Sep.-Dec.*; fr. *Nov.-Jan.*; appears with the rains.

Common in waste places and on rubbish heaps, usually near villages. Throughout the area.

The well known Datura poison is extracted from the seeds of this plant.

410. **Datura fastuosa**, *Linn.* F. B. I. iv. 242; C. ii. 273; Watt iii. 32. Vern. *Kala dhatura, dhatura* (Hin.—N.C.; B.C.).

Resembles the preceding species very closely but the fls. are usually larger, purple or white, and the capsule is only irregularly dehiscent near the apex.

Fls. *Sep.-Dec.*; fr. *Nov.-Jan.*; appears in the rains.

As identified by the capsule the former seems to be the commoner species, but this is also probably found throughout the area.

It has the same poisonous properties as the preceding.

The following species occur under cultivation :—

411. **Solanum Melongena**, *Linn.* F. B. I. iv. 235; Br. 490; C. ii. 269; Watt vi. pt. iii, 258. The Brinjal or Egg plant. Vern. *Baingan, wangen.* (Hin.—N.C.; B.C.).

A prickly herb with ovate sinuate leaves and blue fls. producing the well known vegetable. Very commonly cultivated throughout the area.

412. **Physalis peruviana**, *Linn.* F. B. I. iv. 238; C. ii. 270; Watt vi. pt. i, 225. The Cape Gooseberry.

A small shrub with ovate sinuate leaves, the yellow fr. enclosed in the enlarged papery calyx. The fr. is eaten and is frequently made into jam, or used in tarts. A native of tropical Amercia.

BIGNONIACEÆ.

413. **Dolicandrone falcata**, *Seem.* F. B. I. iv. 380; Br. 493; G. 512; C. ii. 329; Watt iii. 174. Vern. *Dudga* (Jub.; Chin.); *Mersing* (Hin., Mar.—Jub.; Ni.;

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GSL

Am.; Yeo.); *Medsing* (Mar.—Am.); *Jancher* (Sau.); *Karanjelo* (Kur.—Mel.).

A small tree with smooth grey bark exfoliating in irregular scales. Leaves opp. imparipinnate; leaflets 5-7, broadly elliptic to orbicular, glabrous. Fls. white, in few-fld. corymbs. Corolla trumpet-shaped, the lobes crisped; calyx spathaceous. Fr. a narrow flat much curved capsule, 10-18 in. long.

Fls. *Apr.-June;* fr. ripens *Dec.-Feb.;* leaves fall, *Feb.-Mar.;* leaves renewed, *Apr.-May.*

Common throughout the area, chiefly on dry rocky soil.

The wood is hard and seasons well. It does not appear to be used in this area, but elsewhere it is used for building and agricultural purposes.

414. **Dolicandrone crispa,** *Seem.* F. B. I. iv. 379; Br. 494; G. 512; C. ii. 329. Vern. *Padri, padar* (Mar.—Berar); *Tetu* (Kur.—Mel.).

A small to middle sized tree resembling preceding. Leaflets 3-7, ovate, acuminate, often unequal sided at the base. Fls. as in preceding but the lobes more crisped. Capsule slightly curved, 18 in. long, speckled.

Fls. *Mar.-Oct.*

The wood is hard, tough, fine grained and durable. A valuable wood for cabinet work. It somewhat resembles Teak and is often passed off as such.

Local. Mel., but it probably occurs in other Divisions in Berar.

415. **Oroxylum indicum,** *Vent.* F. B. I. iv. 378; Br. 496; G. 510; C. ii. 327; Watt v. 495. Vern. *Sumparal, sona* (Jub.); *Sona padar* (Sau.; Hosh.); *Bhainsa padal* (Chin.); *Phalgatetu, phalangatetu* (Kur.—Mel.); *Mahakal* (*Ak.*).

A small soft wooded tree. Leaves opp. very large, 3-5 ft. long, 2-3 pinnate; leaflets ovate or elliptic,

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acuminate, glabrous. Fls. large, fleshy, dark-purple, in term. erect racemes. Capsule immense, 1-3 ft. long, flat, 2-3 in. broad, red-brown.

Fls. *June-Aug.*; fr. ripens *Dec.-Mar.*; leaves fall, *Nov.-Dec.*; leaves renewed, *June*.

In valleys; scattered, nowhere very frequent. Jub. (Planted near villages—[Hole]); Sau. (Gharakota Res.; Shahgarh Res.); Chin. (Umreth R.); Mel.; Hosh.; Ak.; Ni. (Chandgarh Res.).

The wood is soft, white and inferior. Hole says "planted near villages (in Jub.) often by Basores, who use the seeds for making hats and umbrellas." The root-bark is used in native medicine as an astringent and tonic. In Bombay it is applied to the sore-backs of horses and bullocks.

416. **Stereospermum chelonoides**, *D.C.* F. B. I. iv. 382; Br. 495; G. 514; C. ii. 331; Watt vi. pt. iii, 366. Vern. *Chota padar*, *chota palang* (Jub.); *Padar*, *padal* (Hin.—Mel.; Yeo.).

A middle sized tree, with nearly smooth yellowish bark. Leaves opp. imparipinnate; leaflets 7-11, elliptic, 3-5 in. long, caudate-acuminate, glabrous. Fls. yellow tinged with red, pubescent, in lax. term. panicles. Capsule 12-24 in. long, slender, 4-angled, curved.

Fls. *Apr.-June*; fr. ripens *Oct.-Feb.*; leaves fall, *Feb.-Mar.*; leaves renewed, *June*.

In moist localities, not common. Jub.; Seo.; Mel. (Bairagarh Res.); Yeo.

The wood is grey, hard and fairly durable. In Assam it is used for canoes, buildings, and tea-boxes.

417. **Stereospermum suaveolens**, *D.C.* F. B. I. iv. 382; Br. 495; G. 515; C. ii. 331; Watt vi. pt. iii, 367; Vern. *Padar* (Hin.—N. C.); *Pandri* (Jub.; S. Man.); *Jaimangal* (Jub.; Seo.); *Paral*, *padal* (Mar.—B. C.; Chin.); *Paukarmul* (Dam.); *Padar* (Kur.—Mel.).

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A middle sized or large tree, young shoots very sticky. Leaves opp., imparipinnate; leaflets broadly ovate, 3-6 in. long, shortly acuminate, serrulate, rough above. Fls. dull crimson, fragrant, viscidly hairy, in large pyramidal panicles. Capsule straight, 12-20 in. long, by $\frac{2}{3}$ in., cylindric, the surface covered with white specks.

Fls. *Apr.-May;* fr. *Sep.-Apr.;* almost evergreen; leaves fall, *Apr.;* leaves renewed, *Apr.-May.*

In all Divisions, in plains and hilly localities, but not very common, except in Sal forests.

The wood is hard and durable, and good for building, but the amount of heartwood is small. It does not appear to be much sought after in this area.

418. **Stereospermum xylocarpum,** *Benth.* F. B. I. iv. 383; Br. 495; G. 516; C. ii. 333; Watt vi. pt. iii, 367. Vern. *Paral, bhainsparal* (Jub.); *Padar* (S. Man.); *Katori* (Gond.—S Man.); *Padal* (Ni.; Bet.); *Tetu, kula tetu* (Kur.—Mel.).

A middle sized tree, with thick, light grey bark. Leaves very large, 2-pinnate; leaflets elliptic to ovate 2-3 in. long, shortly acuminate, glabrous. Fls. white tinged with yellow, fragrant, in compound erect pubescent panicles. Capsule 1-3 ft. long, slightly curved, rough with numerous large irregular hard tubercles, the valves over 1 in. in breadth giving the capsule a flattened appearance.

Fls. *Apr.-May;* fr. ripens following *Apr.;* leaves fall, *Apr.-May;* leaves renewed, *June.*

I have not found this very common, but Hole says "common in trap area" (Jub.), and Donald "very common on Mel. hills." Ni. (Kalibhit Res.); Bet.; Seo.; S. Man.

The heartwood which is orange-brown is very hard, tough and elastic and takes a good polish.

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Apparently it is not used in this area, but it is suitable for cabinet work and in Travancore is used for cart poles and shafts. In Western India a resin is extracted from the wood which is used as a remedy for skin eruptions.

419. **Millingtonia hortensis,** *Linn.* F. B. I. iv. 377; Br. 496; G. 509; C. ii. 334; Watt v. 247. The Indian Cork tree. Vern. *Kula nim* (Mar.—B. C.).

A tall straight tree with corky bark. Leaves bi-pinnate, 1-2 ft. long; leaflets ovate, 1-2 in. long, sinuate. Fls. white, fragrant, drooping, with a long slender corolla tube. Capsule linear, 12 in. long.

Fls. *Oct.-Dec.*; does not form fruit in this area; leaves fall, *Jan.-Mar.*; leaves renewed, *Mar.-May.*

Frequently planted in avenues and gardens on account of its handsome foliage and quick growth, but it is shallow rooted and easily blown down.

The following non-indigenous species are cultivated in gardens :—

420. **Bignonia venusta,** *Ker-Gawl.* C. ii. 335.

A climbing shrub, with 3-foliolate leaves and tubular orange fls.

Fls. *Mar.-Apr.*

A native of Brazil.

421. **Tecoma stans,** *Juss.* C. ii. 335; G. 511.

A tall shrub with pinnate leaves, with serrate leaflets and showy yellow fls. Fls. cold weather. Occasionally found run wild as at Asirgarh, Ni.; Hosh. (Pachmarhi Hills).

ACANTHACEÆ.

A marked peculiarity of the majority of the species of this family is the hard recurved acute supports on which the seeds are seated.

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422. **Hygrophila spinosa,** *T. Anders.* F. B. I. iv. 408 ; C. ii. 352 ; Watt iv. 316. Vern. *Untkatara* (Hin.—Jub. ; Seo. ; Sau. ; Ni.) ; *Talbukhara, talmakhana* (seeds).

A stout herb with slightly 4-angled erect stems thickened at the nodes. Leaves in whorls of 6, the outer 2 the largest, oblong-lanceolate, with a large yellow spine in the axil of each. Fls. purple, conspicuous, in whorls. Capsule linear-oblong, ⅓ in. long.

Fls. *Oct.-Dec.*

Gregarious in damp ditches and along tanks. Jub. ; Seo. ; Sau. ; Ni. ; Mel , and no doubt in all Divisions.

The plant is a favourite food of camels ; the seeds are used medicinally as a tonic, and the roots for ulcers.

423. **Calophanes Dalzellii,** *T. Anders.* F. B. I. iv. 411 ; C. ii. 362. Vern. *Ter* (Kur.—Mel.).

A perennial herb, shrubby, many stems from the root, branches angled. Leaves opp., ovate, acute, 1-2 in. long, glabrous. Fls. blue, 1-3 on short ax. peduncles. Capsule oblong, ⅓ in. pointed. Seeds densely clothed with white hairs.

Fls. *Oct.-Nov.*

On rocky hills. Ni. (Kalibhit R.) ; Mel. (Gugamal R.).

424. **Calophanes vagans,** *Wight.* F. B. I. iv. 411 ; C. ii. 362.

A small perennial shrubby herb, closely resembling preceding, from which it may be distinguished by the pubescent leaves, smaller fls. and fr., and narrower calyx teeth.

Fls. *Mar.-May.*

Scarce. Ni. (Piplod R.)

425. **Ruellia patula,** *Jacq.* F. B. I. iv. 412 ; C. ii. 356.

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A small hoary pubescent, sub-erect shrub; stems straggling, much branched. Leaves opp., ovate or elliptic, obtuse, ½-1½ in. long pubescent. Fls. white or blue, ax., solitary. Corolla tube 1½ in. long. Capsule clavate, ½ in. long.

Fls. *Mar.-June*; fr. *Apr.-July*.

Sau. (Rahatgarh Res.); Ni. (Punasa R.)

426. **Ruellia Beddomei**, *Clarke*. F. B. I. iv. 413.

A small undershrub, root-stock woody, annual stems 1-2 ft. Leaves elliptic, acute, pubescent, 2-3 in. long. Fls. white, with rose marks, 1-3, ax. and term. Corolla large, tube 2 in. long. Capsule ¾ in. long.

Fls. *Aug.-Sep.*

Chin (Sillewani R.); Jub.

427. **Petalidium barlerioides**, *Nees*. F. B, I. iv. 416; Br. 499; G. 518; C. ii. 359. Vern. *Inderjata* (Sau.); *Karil* (Hosh.); *Kondak* (Gond.—Sau.).

A much branched shrub, 3-5 ft., the bark exfoliating in long papery strips. Leaves opp., ovate, 2-4 in. long, acuminate, serrate. Fls. white, solitary, crowded on abbreviated lateral branches; corolla throat clothed with brown hairs. Each fl. supported by a pr. of large membranous green veined bracts. Capsule clavate, ½ in. long.

Fls. *Jan.-May*; fr. *Mar.-May*; leaves fall, *Feb. Mar.*; leaves renewed, *Apr.-May*.

Common and gregarious in ravines on sandy soil. Jub.; Sau. (Gharakota Res., Baleh Res.); Hosh. (Roarighat); S. Man.; Ni. (Ratagarh); Seo.

428. **Daedalacanthus roseus**, *T. Anders*. F. B. I. vi. 419; C. ii. 363; Watt iii. 3.

An undershrub 2-4 ft. Leaves opp., oblong-lanceolate, 5-8 in. long, acuminate, entire or crenulate, base

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decurrent into petiole. Fls. with a sickly odour, blue, in long ax. and term, spikes, each fl. in the axil of an obovate bract which is white with prominent green veins. Capsule clavate, ½ in. long.

Fls. *Nov.-Jan.*

As undergrowth in shady and moist forest. Ni. (Kukhdal) ; Mel. (Ghatang) ; Berar—(Dickinson).

429. **Daedalacanthus purpurascens,** *T. Anders.* F. B. I. iv. 420 ; Br. 499 ; G. 518 ; C. ii. 364 ; Watt iii. 2.

An undershrub, 2-4 ft., somewhat similar to preceding. Leaves ovate, 4-6 in. long, acuminate, the base decurrent into the slender petiole. Fls. blue or lilac, in dense term. bracteate spikes ; bracts ovate-lanceolate, pale green with darker veins. Capsule clavate, ½ in. long.

Fls. *Nov.-Feb.* ; *Sep.* (Sau) ; fr. *Nov.-Feb.*

Undergrowth in shady places and the denser forests, Jub. ; Sau. (Ranipura Res.) ; Hosh. (Pachmarhi) ; Ni.

430. **Strobilanthes callosus,** *Nees.* F. B. I. iv. 451 ; Br. 500 ; G. 519 ; C. ii. 368. Vern. *Bhaniyar* (Mel.) ; *Karvi* (Mar.) ; *Marua dona* (Pachmarhi, Hosh.).

A large shrub, 6-20 ft. ; stems rough and warted. Leaves opp. elliptic-lanceolate, 4-9 in. long, acute, crenate, upper surface covered with cystoliths. Fls. large, purplish-blue, in dense ax. spikes, with large overlapping, elliptic, glabrous, viscid, green bracts (strobiliform inflorescence). Capsule obovoid, ¾ in. long, apiculate.

Fls. *Sep.-Nov.* (but only once in 7—9 yrs.) ; fr. *Jan.-Feb.*

Not uncommon in the denser forests in hilly localities. Mel. (often forming dense undergrowth on northern aspects—[Donald]) ; Hosh. (Pachmarhi). Probably also in S. Man. from which Division two unidentified species are reported ; also Ni. (Kalibhit R.), species unidentified.

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Var. **hispida**, *Clarke*, with bracts copiously white hispid.

Fr. *Feb.* when leafless. Hosh. (Roarighat).

431. **Strobilanthes auriculatus**, *Nees*. F. B. I. iv. 453; Br. 500; G. 519; Watt vi. pt. iii, 374.

A shrub, 2-6 ft.; branches quadrangular, glabrous. Leaves opp. oblong, ovate or lanceolate, crenate, often one of a pr. 10 in. long, the other 3 in. Fls. in term. solitary dense spikes, 3 in. long, with imbricate, obovate, glandular and pubescent bracts. Corolla blue, conspicuous. Capsule ⅓ in. long, glabrous.

Fls. *Nov.-Feb.* (once in 6 yrs.); fr. *Mar.-Apr.*

Gregarious in the damper forests, and along rocky ravines in hilly localities; common undergrowth of Sal forest. Hosh.—(Pachmarhi. [Brandis]); Jub. It is probably one of the species found in S. Man.

432. **Strobilanthes membranaceus**, *Talb.* Trees, Shrubs, Bombay Ed. 2 (1902), p. 261. Vern. *Maruadona* (Hosh.).

A stout shrub; branches hispid. Leaves broadly ovate, acuminate, crenate-serrate, rugose, hispid, 2-7 in. long. Fls. in ovoid heads, 1-1½ in. long, densely viscous-hairy.

Fls. *Jan.-Feb.*

Apparently not common. Hosh. (Pachmarhi). This species is of interest, being a little known one described by Talbot as common in N. Kanara. The vernacular name would appear to be a general one for several species of Strobilanthes.

433. **Blepharis boerhaaviaefolia**, *Pers.* F. B. I. iv. 478; C. ii. 349.

A small pubescent undershrub, with wiry prostrate stems, rooting at the nodes. Leaves in whorls of 4,

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GSL

unequal, elliptic to obovate, 1-2 in. long. Fls. white or bluish with a yellow spot on the lower lip, ax. solitary or 2-3 together, surrounded by white membranous bracts with green veins, the apical margins of which are furnished with hairy bristles. Capsule ovoid, ¼-⅓ in. long.

Fls. *Jan.-Feb.*

Undergrowth in rocky places. Jub.; Sau. (Ranipura Res.); Mel. (common).

434. **Barleria Prionitis,** *Linn.* F. B. I. iv. 482; Br. 498; G. 522; C. ii. 379; Watt i. 400. Vern. *Khatserwa* (Chin.; Sau.); *Koranta, koranti, korat* (Mar.—B. C.).

A much branched prickly shrub, 2-4 ft., with opp. glabrous, elliptic, acuminate leaves, 1½-4 in. long. Fls. sessile, yellow, in the leaf axils, with elliptic bristle-tipped bracts Capsule ovoid, ¾-1 in. long.

Fls. *Sep.-Dec.*; fr. *Jan.-Apr.*; leaves fall, *Jan.*; leaves renewed, *Apr.-May*.

In ravines and shady places, very commonly near villages. Chin. (Ambara R.); Jub.; Sau. (common); Hosh. (Pachmarhi); Am.; Bul.; Yeo.; Ni.; Mel.; but probably in all Divisions.

The juice of the leaves is applied by natives to the soles of the feet to harden them.

435. **Barleria montana,** *Nees.* F. B. I. iv. 487; C. ii. 384; Watt i. 400.

Shrubby at the base, erect. 2-3 ft. Leaves elliptic acuminate, 3-6 in. long, glabrous. Fls. large, blue, ax. and in term. spikes, the two outer sepals large, ovate, foliaceous. Capsule 1 in. long, acuminate.

Fls. *Sep.-Oct.*; fr. *Dec.-Jan.*

Gregarious along the banks of steep rocky ravines and nalas in shady places, in the denser forests. A strikingly handsome plant in flower.

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Ni. (Kalibhit R., Piplod R., Asirgarh); Mel. (Chikalda).

436. **Barleria Gibsoni,** *Dalz.* F. B. I. iv. 487; C. ii. 386. Undershrub very similar to *B. montana*, but the fls. and leaves larger, and the seeds are said to be glabrous instead of hairy.

Mel. (Andhera Khora, Gugamal R.).

437. **Barleria cristata,** *Linn.* F. B. I. iv. 488; Br. 498; G. 522; C. ii 382; Watt i. 399. Vern. *Koranta, koranti, korat* (Berar); *Khatserwa* (Sau.).

A spreading hairy undershrub 1-3 ft., with lanceolate or elliptic, acute or acuminate hairy leaves, 2-5 in. long. Fls. blue or rose-coloured, in ax. and term. clusters, the outer sepals membraneous, spinous-toothed. Capsule ½ in. long, ellipsoid.

Fls. *Sep.-Nov.*; fr. *Oct.-Jan.*

Common undergrowth in most forests. Jub.; Sau. (Pagara); Hosh.; Am.; Bul.; Mel.; Ni., and probably in all Divisions.

The seeds are said to be an antidote for snake-bite; the roots and leaves are used to reduce swellings.

438. **Andrographis paniculata,** *Nees.* F. B. I. iv. 501; C. ii. 374; Watt i. 240.

An erect, branched annual, 1-3 ft.; branches quadrangular. Leaves opp., lanceolate, acute, 1-3 in. long, glabrous. Fls. small, rose-coloured, in lax spreading ax. and term. panicled racemes. Capsule ¾ in. long, linear-oblong.

Fls. *Dec.*

Chin. (Ambara R.) and probably in other Divisions.

A decoction of the plant is extensively used in Bengal with other ingredients as a tonic and febrifuge. It is well known under the name "Kalmeg."

439. **Justicia Betonica,** *Linn.* F. B. I. iv. 525; C. ii. 407. Vern. *Mokandar* (Hosh.).

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A much branched more or less decumbent undershrub, 2-4 ft.; stems striate with swollen nodes. Leaves opp., ovate-lanceolate, acute, 2-4 in. long, entire or slightly toothed, glabrous. Fls. small, white, rose spotted, in long ax. and term. branched spikes, conspicuous on account of the ovate, membranous, white, green-veined bracts. Capsule nearly ½ in. long, pubescent, clavate.

Fls. *Oct.-Dec.*; fr. *Nov.-Jan.*

In rocky ravines. Hosh.; Chin. (Ambara R.).

440. **Adhatoda vasica,** *Nees.* F. B. I. iv. 540; Br. 498; G. 523; C. ii. 414; Watt i. 109. Vern. *Rusa* (Hin.—Jub.; Sau.; Chin.; S. Man.); *Adulsa, vasuka* (Mar.—Am.; Ak.); *Ikora* (Kur.—Mel.).

A much branched shrub 4-8 ft. with a strong unpleasant smell. Leaves opp., elliptic-lanceolate, acuminate, glabrous, 5-8 in. long. Fls. white with red spots and streaks, in pedunculate ax. compact spikes. Capsule ¾ in. long, clavate, pubescent.

Fls. *Dec.-Mar.*; fr. *Jan.-Apr.* Evergreen.

Gregarious in waste places, frequently near villages; in such cases possibly originally cultivated and then run wild. Jub.; Sau.; Chin.; Seo.; S. Man.; Am.; Ak.; Mel.

The plant is immune from browsing by cattle and goats. An infusion of the leaves is an effective insecticide. It yields a good charcoal suitable for gun-powder.

VERBENACEÆ.

441. **Lantana Camara,** *Linn.* F. B. I. iv. 562; Br. 502; G. 524; C. ii. 419. Vern. *Raimuniya* (Mel.).

A scrambling shrub with numerous recurved prickles and an odour of black currants. Leaves opp., ovate, serrate, 2-3 in. long, scabrid, pubescent. Fls. red

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or orange, in ax. pedunculate heads. Fr. a collection of small black drupes, like a blackberry.

Fls. *Sep.-Jan.*; fr. *Oct.-Feb.*

Common on the upper slopes of Mel.; hilly localities, Bul.; waste land near villages, Ni.; not uncommonly planted as a hedge, Sau. (Deori R.); Jub.; Hosh. (Pachmarhi).

An introduced American shrub which has spread enormously in parts of Berar. especially the Mel., to the exclusion of more valuable species. It forms impenetrable thickets, and much money has been spent in eradicating it.

442. Lippia geminata, *H.B.K.* F. B. I. iv. 563; Br. 503. Vern. *Basula* (Sau.).

A scrambling shrub; stems quadrangular. Leaves opp. ovate, acute, serrate, pubescent. Fls. in pedunculate ax cylindric heads. Corolla mauve with a yellow throat. Fr. of small dry pyrenes. Very closely resembles *Lantana indica*, from which it may be distinguished by the dry fruit.

In village hedge, Sau. (Deori R.).

443. Tectona grandis, *Linn. f.* F. B. I. iv. 570; Br. 505; G. 526; C. ii. 424. Watt vi. pt. iv, 1. Vern. *Sag, sagwan* (Mar.—Berar); *Sagon* (Hin.—N. C.; Ni.; Bet.); *Sipna* (Mel.); *Teka* (Gond.—Jub.; Seo.). The Teak tree.

A small or large tree with buff coloured bark peeling off in narrow longitudinal strips. Leaves opp., elliptic or obovate, 12-24 in. long, rough above, clothed beneath with dense stellate tawny tomentum. Fls. white, in large erect term. panicles. Fr. a hard bony nut ½ in. diam. enclosed by the inflated papery calyx.

Fls. *July-Aug.*; fr. ripens *Nov.-Jan.*; leaves fall, *Nov.-Dec.*; fresh leaves begin to appear in *May*, but are not fully developed until *June-July*.

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Throughout the area, both on trap, and sandstone; usually absent from quartzite formations and from the Sal area; thrives well on the granite and limestone outcrops bordering the Nerbudda in Ni. It attains fair dimensions, 50-60 ft. in. ht. and 3-6 ft. in girth in parts of Hosh.; Bet.; Ni.; Mel On trap, except on well drained slopes, the Teak is as a rule a crooked tree, not over 3 ft. in girth. Larger trees are usually unsound.

The most valuable timber tree of this area. In universal demand for building and construction and used by all who can afford to do so.

The leaves are used for plates, umbrellas, and thatching for temporary shelters.

444. **Premna latifolia**, *Roxb.*, var mucronata. F. B. I. iv. 577; Br. 511; G. 536; Watt vi. pt. i, 337. Vern. *Kota khursi* (Jub.).

A small tree with light grey thin bark. Leaves opp., ovate-cuneate, 3-6 in. long, acuminate, minutely pubescent on the nerves beneath, with a strong somewhat fœtid smell. Fls. small, white, in term rusty-pubescent corymbose cymes. Fr. a small globose black drupe embraced below by the enlarged calyx.

Fls. *July*; fr. *Oct.-Nov.*

Common on trap, in Jub.—(Hole). Personally I have found it very rare and have only collected it once in Sau. (Ranipura Res.).

It has not been reported from any other Division.

The typical *P. latifolia* is a most variable species. Some botanists consider var. *mucronata* a distinct species.

The leaves are eaten in curries by the natives of S. India.

445. **Premna flavescens**, *Ham.* F. B. I. iv. 578; Br. 511; G. 535.

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A small tree with bluish-grey smooth thick bark, with small whitish tubercles. Leaves ovate-oblong, 5-10 in. long, pubescent beneath ; petiole 2-3 in. Fls. in large rusty-villous corymbose panicles, 4-7 in. diam. Drupe globose, $\frac{1}{6}$ in. diam., subtended by the persistent calyx.

Only reported from Mel. (Morapatha nala, near Baoli) by Donald.

446. Premna barbata, *Wall.* F. B. I. iv. 579 ; Br. 511 ; G. 535. Vern. *Karandi, kota khursi* (Jub.) ; *Tulsigota* (Sau.).

A large shrub or small tree. Leaves ovate or ovate-oblong, acuminate, 3-6 in. long, more or less serrate, base rounded, glabrous above, pleasantly aromatic when crushed. Fls. small, greenish-white, in term. corymbose cymes 1-2½ in. diam. Fr. a small red globose drupe.

Fls. *Apr.-June ;* fr. *June-Aug. ;* leaves fall, *Jan.-Feb. ;* leaves renewed, *May-June.*

Fairly common in trap area, Jub.—(Hole) ; not uncommon both on trap and sandstone, Sau. (Gharakota Res., Ranipura Res.) ; Mel. (on plateaux south of Motha) ; Hosh. (Pachmarhi) ; A.k. ; Yeo.

447. Premna gmelinoides, *Haines* (near flavescens, Ham.). *Ind. Forester*, Vol. XL, p. 398.

A tree somewhat resembling *Gmelina arborea* with light brown bark. Leaves broadly elliptic, ovate and ovate-cordate, 5½-10 in. long, acute or shortly acuminate, entire or coarsely dentate, with sweet aromatic odour, dotted with minute yellow glands, pubescent beneath ; petioles 2-5 in. long. Fls. in broad cymose panicles, with linear-filiform bracts, $\frac{1}{4}$-$\frac{3}{4}$ in. long. Fr. $\frac{1}{8}$ in. diam.

Fls. *July.-Aug.* (?) ; fr. *Aug.-Sep.*

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Along the banks of streams, S. Man. (Jagmandal R.). Reported by Benskin. I have not seen specimens myself.

448. **Gmelina arborea,** *Roxb.* F. B. I. iv. 581; Br. 509; G. 537; C. ii. 424; Watt iii. 514. Vern. *Kumher, khamer* (Hin.—N. C.); *Shewan, sewan* (Mar.—B.C.; Chin.; Jub.); *Khursi* (Gond.—Jub.; Seo.); *Kassamar* (Kur.—Mel.); *Chiman sag* (Yeo.).

A middle sized or large tree with somewhat corky greyish-yellow bark. Leaves opp., broadly ovate, acuminate, 4-9 in. long, dark green above, pale beneath, with tawny tomentum; shining glands at the top of the petiole. Fls. brownish-yellow, conspicuous, in lateral and term. tomentose panicles. Fr. ovoid, 1 in. long, yellow when ripe.

Fls. *Feb.-Apr.*; fr. *May-July*; leaves fall, *Feb.-Mar.*; leaves renewed, *Apr.-May.*

The leaves of seedlings are coarsely toothed. In the moister areas in all Divisions, scattered.

The wood which is greyish or yellowish is close grained and durable, and is valuable for furniture and ornamental work. It is commonly used for making native drums. In Burma it is used for canoes. The fr. is eaten by Gonds. The root is used in native medicine.

449. **Vitex Negundo,** *Linn.* F. B. I. iv. 583; Br. 503; G. 539; C. ii. 428; Watt vi pt. iv, 248. Vern. *Negur, nirgur,* (Hin.—N. C.); *Ningori* (Jub.); *Nirgur* (Hin.—Ni.; Bet.); *Nirguri, nirgudi* (Mar.—Berar); *Nirgud,* (Chin.); *Samalu* (Mel.).

A large much branched shrub, 5-10 ft.; branchlets, underside of leaves, and inflorescence, clothed with a short whitish tomentum. Leaves opp., 3-5 foliolate; leaflets lanceolate, acute, 2-4 in. long. Fls. small, bluish-white, in large term. cymose panicles. Fr. a small black drupe, ¼ in. diam.

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Fls. *June-Dec.*; fr. *Sep.-Feb.*; leaves fall, *Jan.-Feb.* in dry localities; leaves renewed, *Mar.-Apr.*

In all Divisions, gregarious on sandy soil especially along river banks.

The leaves which are aromatic when bruised are employed in native medicine. The young shoots are used to make the wattle bins in which cultivators store their grain.

450. **Vitex trifolia,** *Linn. f.* F. B. I. iv. 583; Br. 504; G. 539; C. ii. 428.

A large shrub, very similar to preceding, from which it is distinguished by the simple or 3-foliolate leaves, sessile obtuse leaflets, and the bluer and larger fls. and fr.

Fls. and fr. same time as preceding.

Scarce. Mel. (Gawalgarh).

451. **Vitex Leucoxylon,** *Linn. f.* F. B. I. iv. 588; Br. 505; G. 542; C. ii. 430. Vern. *Samalu* (Mel.).

A large tree with smooth white bark. Leaves 3-5 foliolate; leaflets lanceolate, glabrous above, midrib only hairy on underside. Fls. fragrant, whitish, in ax. lax corymbose cymes. Fr. ¾ in. long, succulent, obovoid, dark purple when ripe.

Fls. *Feb.-Apr.* (?).

Scarce. Mel.

I have never seen specimens of this tree and have described it from Brandis and Cooke's descriptions. There appears however to be some confusion for Haines describes it (*Ind. Forester*, Vol. XL, p. 401,) as a large shrub or a m. s. tree with dark bark, whereas the authorities referred to say bark "light coloured" or "white," and Gamble says "grey."

452. **Clerodendron Phlomidis,** *Linn. f.* F. B I. iv. 590; Br. 507; G. 543; C. ii. 431; Watt ii. 374. Vern. *Khirni* (Jub.; Sau.); *Inni* (Sau.); *Arni* (Ni.); *Takal* (Berar).

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A shrub or small tree, 10-20 ft., with light brown bark. Leaves opp., ovate, 1½-2½ in. long, obtuse or acute, crenate-dentate. Fls. fragrant, white, in ax. and term. cymose panicles; bracts obovate, leafy. Fr. dry, brown, obovoid, ¼ in. long, 4-lobed.

Fls. *Oct.-Dec.*; fr. *Dec.-Feb.*

Common in hedges near villages and frequently planted as a hedge throughout the B. C. In the N. C. it does not appear to be so common; it is found in Sau.; Jub., though probably also in other Divisions.

453. Clerodendron serratum, *Spreng.* F. B. I. iv. 592; Br. 508; G. 543; C. ii. 432; Watt ii. 374. Vern. *Bhonrmar* (Sau.; Chin.); *Bharangmul* (Mel.).

A perennial shrub; stems 3-6 ft., chiefly annual, sub-herbaceous from a woody root-stock. Leaves opp. and in whorls of 3, elliptic, acute, 5-10 in. long, coarsely serrate. Fls. showy, pale-blue, in large term. pyramidal panicles; one lobe of corolla lip-like and a deeper blue. Fr. succulent, obovoid, ¼ in. long, 4-lobed, shining, black.

Fls. *Aug.-Sep.*; fr. *Sep.-Nov.*; the shoots usually die or get burnt down between *Feb.* and *May*, and fresh shoots appear *June*.

Common in hedges in open country, Sau.; Jub.; Chin.; Seo.; Ni.; Mel.; Yeo. (Pusad R.); and probably in all Divisions.

454. Clerodendron infortunatum, *Gærtn.* F. B. I. iv. 594; Br. 507; G. 543; C. ii. 432; Watt ii. 373.

A shrub 4-6 ft. with bluntly quadrangular fulvous-hairy branches. Leaves ovate-cordate, 4-8 in. long, acuminate, pubescent beneath. Fls. in large term. 3-chotomous, corymbose panicles; corolla white tinged with pink, densely pubescent outside. Fr. ⅓ in. diam, black, globose, seated on the much enlarged pink calyx.

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Fls. *Mar.*

Gregarious in shady places, Jub.—(Hole); Chin. (Umreth R.). I have not seen specimens, and think it must be scarce in this area.

The juice of the leaves is used medicinally as a substitute for chiretta.

455. **Clerodendron Siphonanthus,** *R. Br.* F. B. I. iv. 595; Br. 508; G. 543; C. ii. 433; Watt ii. 375. Vern. *Bhonrmar, rakatbhera* (Sau.).

A straight stemmed glabrous shrub, 2-4 ft.; branches herbaceous, hollow, channelled. Leaves opp. or whorled, linear-lanceolate, 6-9 in. long. Fls. in ax. pedunculate cymes, forming a large term. panicle. Corolla white, then cream-colour, with a long curved tube 3-4 in. long. Fr. ovoid, blue-black, supported by the enlarged red spreading calyx.

Fls. *July-Oct.*; fr. *Nov.-Dec.*

Not uncommon in hedges and in fields on black cotton soil. Jub.; Sau. (Rangir; Rehli and Deori R.).

The root is used medicinally in diseases of the lungs.

456. **Holmskioldea sanguinea,** *Retz.* F. B. I. iv. 596; Br. 506; G. 544; C. ii. 437; Watt iv. 260.

A straggling and scandent shrub. Leaves opp. ovate, entire or crenate, 2-4 in. long. Fls. red, in short ax. and term. cymes; calyx large, red; corolla brick red or orange. Fr. obovoid, 4-lobed, supported by the enlarged calyx.

Only found once undoubtedly wild; cultivated near villages, Jub.—(Hole).

The following non-indigenous species are commonly cultivated in gardens:—

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457. **Duranta Plumieri**, *Jacq.* F. B. I. iv. 560 ; C. ii. 437.

A large shrub with oblong-lanceolate acuminate leaves and blue fls. in racemes, succeeded by orange coloured berries. A native of S. America and the West Indies.

458. **Petrea volubilis**, *Linn.* C. ii. 437.

A climbing shrub with opp. rough leaves and blue fls., with large persistent purplish-blue calyx. A native of tropical America.

459. **Clerodendron fragrans**, *R. Br.* F. B. I. iv. 589.

A shrub with large wrinkled leaves, fœtid when bruised and fragrant purplish-white fls. like small double roses. A native of China.

LABIATÆ.

460. **Ocimum sanctum**, *Linn.* F. B. I. iv. 609 ; C. ii. 440 ; Watt v. 443. The Holy Basil. Vern. *Tulsi* (Hin.).

A much branched annual aromatic herb ; stems purplish somewhat woody below, clothed with soft hairs. Leaves opp., elliptic-oblong, 1-2 in. long, pubescent, gland-dotted. Fls. small, purplish, in close whorls, in racemes. Fr. a minute dry nutlet, enclosed in the enlarged membranous calyx.

Fls. and fr. *July-Oct.*

Grown in or near every Hindu house, on shrines, and in temples, the Holy Basil is the most sacred plant in the Hindu religion.

The leaves have expectorant properties ; their juice is largely used in native medicine.

With the above may be mentioned **O. Basilicum**, *Linn.*, which has a strong aromatic flavour, and is employed as a seasoning for culinary purposes ; and **O. canum**, *Sims*, the Hoary Basil, both of which are commonly met with near and in villages, the former cultivated and run wild, the latter indigenous.

461. **Plectranthus rugosus**, *Wall.* F. B. I. iv. 620 ; Br. 516 ; G. 546 ; Watt vi. pt. i, 291.

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A small stiff pubescent shrub. Leaves opp. ovate, 1 in. long, leathery, crenate-serrate, densely white tomentose beneath. Fls. small, purplish-white, in ax. cymes. Fr. of 4 minute nutlets.

Mel. (Gawalgarh Fort, 3,600 ft.).

462. **Lavandula Burmanni,** *Benth.* F. B. I. iv. 631; C. i. 452.

An erect herbaceous undershrub, 2-3 ft.; stems quadrangular, pubescent. Leaves opp., 1½-4 in. long, pinnatisect, the lobes entire or dentate. Fls. blue, in simple or compound spikes. Fr. of 4 minute black nutlets.

Fls. *Oct.-Nov.*

Common on trap, Jub.—(Hole); Bet.; Ni. (Asirgarh).

463. **Pogostemon plectranthoides,** *Desf.* F.B.I. iv. 632; Br. 516; C. ii. 454. Vern. *Kora, banlengor* (Jub.).

A large erect much branched aromatic shrub, 4-6 ft.; branches quadrangular. Leaves opp., ovate, 2-5 in. long, serrate, pubescent. Fls. small, white with purple stamens, in dense villous sub-capitate 1-sided bracteate cymes, forming a large term. panicle. Fr. of 4 minute brown-black nutlets.

Fls. *Jan.-Feb.*

Common, frequently gregarious, in shady and moist localities, in ravines and along nalas. Jub.; Sau.; Chin. (Umreth R.); S. Man.; Hosh. (Pachmarhi); Mel. (Gugamal R.); Bet.; and probably in other Divisions.

464. **Colebrookia oppositifolia,** *Smith.* F. B. I. iv. 642; Br. 515; G. 547; C. ii. 459; Watt ii. 503. Vern. *Chota bhandara* (Mel.); *Deodona* (Hosh.); *Bhandara* (Chin.); *Dhona* (Seo.).

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A much branched shrub, 5-10 ft., with sub-quadrangular channelled branches; young shoots clothed with white tomentum. Leaves. opp. or in whorls of 3, elliptic-lanceolate, 4-8 in. long, crenulate, white tomentose beneath. Fls. small, white, closely whorled, in panicled spikes. Fr. a minute nutlet.

Fls. *Dec.-Feb.*; fr. *Feb.-Mar.*

In valleys and on shady hillsides on the higher elevations. Jub.; S. Man. (Amarkantak, 3,200 ft.); Mel. (Gugamal R.); Hosh. (Bori Res.; Pachmarhi); Bet.; Chin. (Umreth R.); Seo. (Nerbudda R.).

A preparation of the root is used by the Santals in epilepsy.

AMARANTACEÆ.

465. **Achyranthes aspera**, *Linn.* F. B. I. iv. 730; C. ii. 495; Watt i. 81. Vern. *Aghada* (Mar.—Berar).

An erect herb, stem sub-quadrangular, ribbed, pubescent. Leaves opp., thick, elliptic or obovate, $1\frac{1}{2}$-$2\frac{1}{2}$ in. long, pubescent. Fls. greenish-white, in long term. spinous bracteate spikes. Fr membranous, oblong, enclosed in the hardened perianth.

Fls. *Nov.-Jan.*

Common in fields and babul-bans; Am., Yeo.; Mel.; Ni., and no doubt elsewhere.

The leaves are eaten, and in famine years the seeds also. The plant possesses valuable medicinal properties as a diuretic and tonic; it is also applied as a remedy in scorpion and insect bites.

CHENOPODIACEÆ.

466. **Basella rubra**, *Linn.* F. B. I. v. 20; C. ii. 509; Watt i. 403. Vern. *Poki* (Hin.—Sau.).

A much branched twining, fleshy, glabrous, perennial herb. Leaves alt. broadly ovate, acute, 2-5 in. long,

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thick. Fls. white or red, sessile, in lax pedunculate spikes. Fr. size of a pea, succulent, red or black.

Fls. and fr. *Nov.-Jan.*

Very common in village hedges. Jub.; Sau.; Ni., and probably in every Division.

Extensively cultivated and used as a pot herb by natives.

NYCTAGINACEÆ.

467. **Bougainvillæa spectabilis**, *Willd.* Br. 517; G. 549; C. ii. 483.

A large scrambling thorny shrub, with small pale yellow fls. supported by large purple or magenta coloured bracts. Fls. in profusion in the hot weather.

Commonly planted in gardens. A native of Brazil.

POLYGONACEÆ.

468. **Polygonum glabrum**, *Willd.* F. B. I. v. 34; C. ii. 514; Watt vi. pt. i, 318.

A procumbent perennial, thick and woody below, with reddish stems, 2-5 ft. Leaves alt., lanceolate, acuminate, 3-9 in. long, glabrous, with sheathing stipules. Fls. small, pink, in term. panicled racemes. Fr. a small, ovoid, black nutlet.

Fls. *Nov.-Mar.*

Common along nalas, tank margins and in marshy places, Sau.; Ni.; Mel.; and probably throughout the area.

The leaves and young shoots are eaten as a pot herb in Assam and Chota Nagpur.

ARISTOLOCHIACEÆ.

469. **Aristolochia indica**, *Linn.* F. B. I. v. 75; Br. 522; C. ii. 524; Watt i. 315. Vern. *Kari gurisar* (Sau.).

A twining shrub, woody at the base, stems grooved, glabrous. Leaves variable, linear to obovate-oblong,

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2-5 in. long, obtusely acuminate, base truncate or sub-cordate. Fls. 1-3, in ax. arrested racemes. Perianth greenish-white with globose inflated base and trumpet-shaped mouth, lip purplish-brown. Fr. an oblong capsule, 1½-2 in. long.

Fls. *July.-Aug.*

Not common. Sau. (Abchand Res., Hatkoh Res.).

Said to be an antidote for snake-bite. It is sometimes used to produce abortion.

PIPERACEÆ.

470. **Piper Betle,** *Linn.* F. B. I. v. 85; Br. 523; G. 554; C. ii. 528; Watt. vi. pt. i, 247. The Betel vine. Vern. *Pan* (Hin.—N. C.; B. C.).

A perennial climber with ovate-cordate leaves commonly cultivated for its leaves which are universally chewed with lime and areca nut by natives.

LAURACEÆ.

471. **Litsæa sebifera,** *Pers.* F. B. I. v. 157; Br. 536; G. 570; C. ii. 539; Watt. v. 83. Vern. *Maida lakri* (Hin.—Jub.; Sau.; Chin.; Hosh.; S. Man.; Mel.); *Lenja* (Kur.—Mel.); *Lenjo* (Seo.).

A small to middle-sized tree with grey bark, inner bark viscid. Leaves alt., ovate or elliptic-lanceolate, 5-9 in. long, acute, glabrescent. Fls. greenish-white, in ax. pedunculate umbels, which in bud are enclosed by 4-6 membranous bracts. Fr. globose, ¼ in. diam., purple.

Fls. *May-July*; fr. *Oct.-Nov.*; evergreen, new shoots in *May*.

Scattered, nowhere very common. Jub.; Sau. (Bahadapur Res., Dumar Res.); S. Man. (Bajak); Chin.; Seo.; Hosh. (Pachmarhi); Mel. (Gugamal R.); Bet.; Yeo.

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Var. **glabraria**, *Juss.*, with more ovate and acute leaves, is reported from Jub.

The wood is good and durable, and seasons well, but being so scattered is in no demand. The mucilaginous bark is largely used in native medicine as an astringent in diarrhœa and dysentery.

PROTEACEÆ.

472. **Grevillea robusta**, *A. Cunn.* Br. 544; G. 576. Silky Oak.

A large tree with pinnate leaves and deeply pinnatifid pinnæ, and orange coloured tubular fls. in one-sided racemes, on short leafless branchlets.

A native of Queensland and New South Wales. Cultivated in gardens. Hosh. (Pachmarhi); Jub.; Seo.

LORANTHACEÆ.

473. **Loranthus longiflorus**, *Desr.* F. B. I. v. 214; Br. 549; G. 583; C. ii. 548. Watt v. 92. Vern. *Banda* (Hin.—N.C.; Ni.; Bet.); *Kawârka* (Mel.; Bul.); *Kawarak* (Yeo.); *Kowvel* (Am.).

A parasitic shrub, bark grey. Leaves opp., coriaceous, variable in shape, usually ovate, 3-6 in. long. Fls. scarlet and orange, tubular, 1-2½ in. long, in ax. and term. racemes. Fr. an oblong pulpy berry, ⅓-½ in. long.

Fls. *Dec.-Mar.*; fr. *Feb.-Apr.*; evergreen.

Common in all Divisions, most frequently on *Bassia latifolia*, *Buchanania latifolia*, *Boswellia serrata*, *Acacia leucophlœa*.

474. **Loranthus Scurrula**, *Linn.* F. B. I. v. 208; Br. 549; G. 582; C. ii. 546. Vern. *Banda* (Hin.—Hosh.; S. Man.)

A parasitic shrub, young shoots, leaves, and inflorescence clothed with short soft white or ferrugineous tomentum. Leaves elliptic, 2-4 in. long. Fls.

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greenish-yellow, ½-1 in. long, in ax. short racemes. Fr. yellow, pear-shaped, ⅓ in. long.

Fls. *Nov.-Jan.*; fr. *Dec.-Mar.*

Common on *Phyllanthus emblica*, Mel. (Chikalda, 3,400 ft.); Hosh. (Pachmarhi); S. Man. (Dindori R.). A species reported by Hole as common in Jub. on *Butea frondosa* was identified by him as L. puberulentus, but is more probably this species. I have seen no specimens from Jub.

475. **Viscum articulatum,** *Burm.* F. B. I. v. 226; Br. 552; G. 584; C. ii. 553; Watt vi. pt. iv, 246. Vern. *Banda* (Hin.—N. C.; Ni.; Mel.).

A leafless parasitic shrub, resembling and allied to the European Mistletoe. Branches flat, green, striate. Fls. minute, fascicled at the nodes. Fr. a globose yellowish-white berry.

Fls. *Nov.-Dec.*; fr. *Dec.-Jan.*

Scattered, nowhere plentiful, usually on the higher plateaux. Found on *Zizyphus jujuba*, *Cordia Macleodii*, *Diospyros Melanoxylon*, *Schleichera trijuga*. Jub.; Sau. (Bandri Res., Saugor R.); Chin.; Seo.; Hosh. (Pachmarhi.); S. Man. (rare); Ni. (Jambupani Res., Kalibhit R.); Mel.; Bul. (2,000 ft.).

SANTALACEÆ.

476. **Santalum album,** *Linn.* F. B. I. v. 231; Br. 553; G. 585; C. ii. 555; Watt vi. pt. ii, 461. Vern. *Chandan* (Hin.—B. C.; Sau.). Sandalwood.

A small tree with slender drooping branchlets and almost black rough bark. Leaves opp., elliptic-lanceolate, 1½-2 in. long, glabrous. Fls. brownish-purple, in ax. and term. short panicled cymes. Fr. globose, shining, black, ½ in. diam.

Fls. *Mar.-July*; fr. *Nov.-Dec.*; evergreen.

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Throughout the B. C. with the exception of Bet., but whether indigenous or only introduced seems doubtful. Ni. (only in one small locality, south of Chandni on the Taptee river); Sau. (Jallundhar Res., Cheola Ramgarha Res.).

This is the Sandalwood of commerce. The heartwood which is yellowish-brown is strongly scented, but in Berar where the tree does not appear to thrive well, the wood is almost scentless; this is also true of the wood in Sau. though traders purchase it to mix with the scented wood.

Sandalwood is chiefly used for the manufacture of carved boxes, frames, and other small articles. It is mainly exploited from S. India. A valuable essential oil is distilled from the wood and roots which is used in perfumery and medicinally.

477. **Osyris arborea,** *Wall.* F. B. I. v. 232; Br. 554; G. 588; C. ii. 555; Watt v. 655.

A large glabrous shrub, branchlets 3-sided, angular. Leaves alt., elliptic-oblong or obovate, 1-1½ in. long, mucronate, almost sessile. Fls. minute, in ax. pedunculate 5-10 fld. clusters. Fr. a globose yellow drupe ¼ in. diam.

Fls. *Jan.-Feb.*; fr. *Feb.*

Rare in this area. Only obtained so far in Hosh. (Pachmarhi; Bori Res.)

The plant is normally glabrous but a var. **puberula** with branchlets, leaves and inflorescence pubescent is found in the Pachmarhi hills and Bori Res.

An infusion of the leaves has powerful emetic properties. In Kumaon the leaves are used as a substitute for tea.

EUPHORBIACEÆ.

478. **Euphorbia Tirucalli,** *Linn.* F. B. I. v. 254; Br. 558; G. 591; C. ii. 570; Watt iii. 301. Vern.

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Thuhar, thuar, (Hin.—Jub.; Sau.; Seo.; Ni.; Mel.); *Shar, niwarang* (Mar.—Berar).

A large shrub or small tree with milky juice and smooth, round, green, almost leafless branches. Leaves fleshy, linear, up to ½ in. long. Fls. in heads, in involucres resembling single fls. at the ends and in the forks of the branches. Fr. a 3-lobed capsule, villous, ¼ in. long.

Fls. *Mar.-Apr.*

Introduced and extensively planted in villages as a hedge and found as an escape, throughout the B. C. Also in Jub.; Sau.; Seo. and probably throughout the N. C. A native of Africa.

479. **Euphorbia Nivulia**, *Ham.* F. B. I. v. 255; Br. 558; G. 590; C. ii. 564; Watt iii. 298. Vern. *Thuhar, thuar* (Hin.—N. C.; Ni.; Mel.); *Niwarang* (Mar.—B. C.).

A small tree, 15-20 ft. with thick corky bark when old; branches thick fleshy, round, armed with sharp spines in pairs. Leaves alt., towards the ends of the branches, fleshy, obovate, 4-8 in. long, tapering towards the base, glabrous. Fls. minute, in fleshy 5-lobed involucres, in peduncled cymes (3 fls. in each involucre) from the leaf scars and near the ends of the branches. Capsule ¼ in. broad.

Fls. *Feb.-Apr.*; fr. *Apr.-May*; leaves fall, *Nov.-Dec.*; leaves renewed, *June.*

Common on steep dry rocky hills, particularly on sandstone. In all Divisions.

The milky juice is considered a purgative; it is also said to be an antidote in snake-bites.

480. **Euphorbia neriifolia**, *Linn.* (Syn. E. ligularia, *Roxb.*). F. B. I. v. 255; Br. 558; G. 591; C. ii. 563; Watt iii. 297. Vern. *Thuhar, thuar* (Hin.—N. C.; B.C.); *Niwarung* (Mar.—B. C.).

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A large shrub or small tree, 10-15 ft., very similar to preceding, but distinguished by the branches bearing 5 spirally twisted ribs furnished with stipular spines, in pairs. Leaves alt., cuneate or oblanceolate, 6-12 in. long. Fls. as in preceding. Capsule deeply 3-lobed, ½ in. broad.

Fls. *Feb.-Mar.*; fr. *Apr.-May*; leaves fall, *Jan.-Feb.*; leaves renewed, *June*.

Common in villages, planted as a hedge, but not seen wild in this area.

The milky juice has the same properties as those of *E. Nivulia*.

481. **Bridelia retusa,** *Spreng.* F. B. I. v. 268; Br. 560; G. 595; C. ii. 572. Watt i. 536. Vern. *Kasai* (Hin.—Jub.; Sau.; Dam.; Chin.; Seo.; Ni.; Bet.); *Kassi* (S. Man.); *Sankana* (Ni.; Bet.); *Katiain, katiyen* (Mar.—Berar) *Karkha, khadka* (Kur.—Mel.); *Biula* (Yeo.).

A small to middle sized tree, with rough dark grey bark with longitudinal cracks. Leaves alt., elliptic-oblong, 4-10 in. long., usually finely tomentose beneath with 15-20 pr. of prominent parallel sec. nerves. Fls. small, greenish, in ax. clusters or on long ax. paniculate spikes. Fr. fleshy, globose, ¼ in. diam., yellowish, or purple-black.

Fls. *July-Sep.*; fr. *Nov.-Jan.*; semi-deciduous, *Mar.-Apr.* the leaves turning reddish-brown before falling; leaves renewed, *Apr.-May*.

Common throughout the area.

The wood is of good quality, and is used to a certain extent for agricultural implements, carts and building. It stands well under water. The leaves are used for cattle fodder. The fr. is edible.

482. **Cleistanthus collinus,** *Benth.* F. B. I. v. 274; Br. 561; G. 597. Vern. *Garar* (S. Man.); *Rari* (Seo.); *Garar, garadi* (Mar.—Chin.); *Garari* (Mar.—Yeo.).

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A small to middle sized tree with blackish much cracked bark. Leaves alt., broadly ovate to orbicular, 2-4 in. long, glabrous. Fls. yellowish-green, in small ax. clusters. Fr. a woody, dark brown, globose, 3-lobed, shining capsule, ¾ in. diam.

Fls. *Apr.-May ;* fr. following *Mar.-Apr. ;* leaves fall, *Feb. ;* leaves renewed, *May*.

Not common except in south of B. C. ; S. Man. (small area north of Mandla town ; along Halon river on the Balaghat border) ; Chin. (Umreth R. ; Amarwara R.) ; Seo. ; Yeo. (Ganganmal Res.).

The wood is red, hard, strong and durable, and highly esteemed for rafters in Berar.

483. **Phyllanthus reticulatus**, *Poir*. F. B. I. v. 288. Br. 570 ; G. 598 ; C. ii. 585 ; Watt vi. pt. i, 223. Vern. *Mukhru* (Jub.) ; *Pithor, pittur* (Mel. ; Ak.) ; *Kamoi* (Ni.) ; *Nirmandi* (Yeo.).

A straggling, sometimes climbing shrub, with long drooping branchlets. Leaves alt., oblong or elliptic, ½-1¼ in. long, obtuse or acute, glabrous. Fls. small, brown, solitary or several together, on slender ax. peduncles. Fr. a purple fleshy berry, ⅛ in. diam.

Fls. and fr. at different seasons ; *Jan.-Mar.* (Jub. ; Sau.) ; *Aug.* (Ni.) ; more or less deciduous—(Haines).

Not uncommon along river banks and in moist low-lying localities. Jub. (in hedges in open country) ; Hosh. (Malni Res.) ; Sau. (Dulchipur Res.) ; Ni. (Punasa Res. ; banks of the Taptee river) ; Yeo. (Mursud Res.) ; Ak. ; Mel.

The twigs are used as tooth-brushes. The bark is used in native medicine as an alterative.

484. **Phyllanthus emblica**, *Linn*. F. B. I. v. 289 ; Br. 570 ; G. 599 ; C. ii. 585 ; Watt vi. pt. i, 217. Vern. *Aonla* (Hin.—Ni. ; Bet. ; N. C.) ; *Aunra* (Hin.—

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Jub.) ; *Aonra, aonri* (S. Man.) ; *Nalli, lalli* (Gond.—Jub. ; Seo.) ; *Aonli, awla, aola* (Mar.—Berar).

A small to middle sized tree with light grey bark peeling off in scales. Branchlets closely set with narrowly linear distichous leaves, ½ in. long, giving the appearance of pinnate leaves. Fls. minute, greenish-yellow, in ax. fascicles on the leaf bearing branchlets. Fr. globose, yellow or reddish, ¾ in. diam.

Fls. *Mar.-May* ; fr. ripens *Nov.-Mar.* ; leaves fall, *Jan.-Feb.*; leaves renewed, *Apr.-May*.

Common in all Divisions.

The wood gives good poles for building, and is used for agricultural implements. The fr. which is very astringent is pickled and eaten ; it is also used medicinally and for dyeing and tanning.

485. **Glochidion velutinum,** *Wight.* F. B I. v. 322 ; Br. 574 ; G. 602 ; C. ii. 578 ; Watt iii. 506. Vern. *Khonda* (S. Man.) ; *Kolya* (Mel.) ; *Boria tiwas* (Bairat, Mel.).

A small tree, with rough brown bark ; all parts softly pubescent. Leaves alt., ovate or elliptic, 2-6 in. long, with somewhat unequal cuneate base, and 6-8 pr. of prominent sec. nerves. Fls. small, greenish-yellow, ax., solitary and clustered. Fr. a depressed globose pubescent capsule ⅓ in. diam.

Fls. *Apr.-May* on new shoots.

Not common. Confined to hilly localities and the higher elevations. N. Man. (Dhanwahi R.) ; S. Man.; Chin. (Umreth R.) ; Hosh. (Pachmarhi) ; Mel. (Bairat).

The wood does not appear to be used. In the N.-W. Himalayas the bark is employed for tanning.

486. **Fluggea microcarpa,** *Bl.* F. B. I. v. 528 ; Br. 569 ; G. 603 ; C. ii. 581. Vern. *Chiregori, sirkin* (Jub.) ; *Chirechar* (Jub. ; S. Man.) ; *Chakheran* (Sau.) ; *Pithondi* (Mar.—Mel.) ; *Pittor* (Bul.) ; *Jhondri* (Ni.).

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A large spreading shrub, 8-12 ft., with light coloured bark. Leaves alt., elliptic or obovate, obtuse, 1-3 in. long, glabrous. Fls. small, greenish, in ax. clusters on short capillary peduncles. Fr. a globose white berry, ¼ in. diam.

Fls. *June-July*; fr. *Aug.-Oct.*; semi-deciduous, *Feb.-Mar.*; leaves renewed, *Apr.-May*.

Common in hedges in open country and on black soil. Jub.; Sau.; Chin. (Sillewani R.); Hosh. (Bori Res.); S. Man.; Ni.; Bul.; Mel.; Yeo. (Darwha R.), and probably in all Divisions.

The bark is very astringent and is said to be used to intoxicate fish. The fr. is eaten by parrots and other birds.

487. **Fluggea Leucopyrus**, *Willd.* F. B. I. v. 328; Br. 569; G. 603; C. ii. 581.

A rigid thorny shrub, the branchlets usually ending in sharp spines. Leaves obovate, ½-1 in. long, glabrous. Fls. and fr. as in preceding species.

Fls. *June-July*.

Reported by Donald from Hosh. (Pachmarhi). I have not seen specimens.

488. **Breynia rhamnoides**, *Muell.* F. B. I. v. 330; Br. 568; G. 604; C. ii. 583; Watt i. 534. Vern. *Brijbol* (Sau.).

A large glabrous shrub with numerous horizontal branches; branchlets angular. Leaves alt., distichous, ovate or elliptic, 1-1½ in. long. Fls. minute, green ax., solitary and in small fascicles. Fr. a globose, red, nearly sessile, succulent berry, ¼ in. diam.

Fls. *June-July*; fr. *July-Aug.*

In the beds of streams; rare. Sau. (Abchand Res.).

489. **Putranjiva Roxburghii**, *Wall.* F. B. I. v. 336; Br. 566; G. 604; C. ii. 590; Watt iv. pt. i, 372. Vern. *Putranjiva* (Hin.—Sau.).

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A middle sized tree with drooping branches. Leaves alt., dark green, shining, elliptic-oblong, 2-4 in. long, slightly serrate, base unequal sided. Male fls. yellow, in dense ax. clusters. Fem. fls. green, 1-3, ax. Fr. ellipsoid, ½-¼ in. long, hoary-tomentose.

Fls. *Mar.-Apr.* ; fr. takes 12 months to ripen. Evergreen.

Not reported as indigenous in this area. Cultivated and planted as a roadside tree, Sau.

The stones of the fr. are made into necklaces and put round the necks of children to ward off evil.

490. **Antidesma Ghæsembilla,** *Gærtn.* F. B. I. v. 357; Br. 564; G. 610; C. ii. 592; Watt i. 270. Vern. *Jhondri* (Mar.—Ni.); *Jhondarli* (Seo.); *Khatua, manmakoiya* (Sau.).

A small to middle sized tree with blackish rough bark; branchlets tomentose. Leaves alt., broadly elliptic, 2-4½ in. long, obtuse or emarginate, softly tomentose beneath. Fls. minute, in tomentose panicled spikes. Fr. compressed globose, ⅛ in. across, red to black.

Fls. *June-July* ; fr. *Aug.-Oct.* ; leaves fall, *Feb.* ; leaves renewed, *May*.

Scattered, but nowhere very common. Seo.; Ni. (Balwara, Punasa Res.); Sau. (Gharakota Res.; Rahatgarh; Baleh Res.). In the Baleh Res. trees up to 2½ ft. girth and 30 ft. high are met with.

It probably occurs, but has been overlooked, in other Divisions.

The leaves are eaten in Bengal.

491. **Antidesma diandrum,** *Roth.* F. B. I. v. 361; B. 565; G. 610; C. ii. 593. Watt i. 270. Vern. *Khatua* (Hin.—Jub.; Sau.; S. Man.; Hosh.; Chin.); *Amta* (Jub.; Chin.; Mel.); *Ambat bhonsa* (Ak.); *Saroti baji*(?) (S. Man.); *Katambi* (Mariampur, Mel.); *Masur bari* (Gond.—S. Man.).

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A large shrub or small tree, 8-15 ft., usually glabrous except the shoots. Leaves elliptic or obovate-lanceolate, 1½-4 in. long, acute, slightly pubescent beneath, base acute. Fls. minute, green, in slender lax spikes, 2-4 in. long. Fr. ⅙ in. diam., compressed, reddish-purple, edible.

Fls. *July-Aug.*; fr. *Nov.-Jan.*; leaves turn brick red before falling in *Jan.-Feb.*; leaves renewed, *May-June.*

In valleys and moist localities; scattered. Jub.; Sau. (Gharakota Res.; Hatkoh Res.; Jallundhar Res.); Chin. (Sillewani R.); Seo.; Hosh. (Malni); Mel. (Gugamal R.; Andhera khora); S. Man. (Ramnagar).

The leaves are bitter and are eaten as a vegetable by jungle tribes.

492. **Jatropha Curcas,** *Linn.* F. B. I. v. 383; Br. 576; G. 613; C. ii. 598; Watt iv. 545. Vern. *Ratanjot* (Hin.—Sau.; Chin.; Ni.); *Chandarjot* (Hin.—Jub.; Seo.; Chin.; Hosh.; S. Man.); *Baranda* (Jub.); *Mogali erandi* (Mar.—Mel.).

A large soft wooded shrub, 10-15 ft. Leaves alt. 3-5 angled or lobed, 4-7 in. diam., glabrous. Fls. small, yellowish-green, in term. cymose panicles. Fr. ovoid, 1-1½ in. long.

Fls. *July-Sep.*; fr. *Oct.-Dec.*; leaves fall, *Dec.-Jan.*; leaves renewed, *May-June.*

A native of tropical America but naturalised in India and commonly grown as a fence in villages on account of its rapid growth. Jub.; Sau.; Chin.; Seo.; Hosh.; S. Man.; Ni.; Bet.; Mel. and no doubt in all Divisions.

The seed is known as the Physic-nut and is a violent purgative and emetic.

493. **Jatropha gossypifolia,** *Linn.* F. B. I. v. 383; Br. 576; G. 612; C. ii. 597. Vern. *Pilu* (Sau.).

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A shrub, 3-5 ft.; branches and leaves at first purplish brown then green. Leaves palmately 3-5 lobed, 3-8 in. diam.; petioles clothed with numerous branched gland-tipped bristles. Fls. small, red-brown, in term. cymes.

Fls. *July-Sep.*; fr. *Sep.-Oct.*; leaves fall, *Feb.*; leaves renewed, *Apr.-May*.

A native of Brazil, cultivated and run wild in this area. Sau. (Civil Station); Ni. (Civil Station, Khandwa); Chin. (Umreth R.).

The seeds give an oil which is used in native medicine.

494. **Croton oblongifolius,** *Roxb.* F. B. I. v. 386; Br. 577; G. 614; C. ii. 599. Watt ii. 616.

A middle sized tree, young shoots and inflorescence densely clothed with minute orbicular silvery scales. Leaves alt., oblong-lanceolate, 5-10 in. long, more or less crenate, glabrous when mature. Fls. pale yellowish-green, solitary or fascicled in the axiles of minute bracts, on long erect often fascicled racemes. Fr. a globose capsule, faintly 3-lobed, ½ in. diam.

Specimens, in leaf only, found at Myhar on the Dhasan river, Sau., have been identified as the above by the Forest Botanist, Dehra Dun. Brandis records it as found in the Central Provinces.

495. **Trewia nudiflora,** *Linn.* F. B. I. v. 423; Br. 590; G. 617; C. ii. 614. Watt vi. pt. iv. 76.

A large deciduous tree with smooth grey bark. Leaves opp., ovate, acuminate, 3-7 in. long, base cordate, 3-5 nerved, glabrous above, clothed beneath with cottony wool. Male fls. in lateral racemes, 3-8 in. long; fem. fls. on long peduncles, solitary or 2-3 together. Fr. globose, 1-1½ in. diam., almost woody.

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Fls. *Dec.-Mar.*

Near rivers and in other damp places; not common, Jub.—(Hole); S. Man. (bank of the Nerbudda near Mandla)—Kenny. I have seen no specimens of this tree. In leaf it closely resembles *Gmelina arborea*, but the fls. at once distingush it.

The wood is white and soft and is used elsewhere for drums.

496. **Mallotus philippinensis**, *Muell.* F. B. I. v. 442; Br. 590; G. 619; C. ii. 615; Watt v. 114. Vern. *Rori* (Hin.—Jub.; Sau.,; Dam.; Hosh.; S. Man.; Seo.; Ni.; Bet.) *Rauni* (Hin.—Jub.; Ni.; Bet.); *Kuku, shendri* (Mar.—Berar; Chin.); *Shendri* (Jub.); *Kunkuma* (Ni.; Bet.; Ak.); *Kamela* (The name for the red powder on the fr.).

A small tree, 15-25 ft., branchlets and young parts clothed with rusty pubescence. Leaves alt., ovate or ovate lanceolate, 3-6 in. long, acuminate, glabrous above, pubescent and with numerous small red glands beneath, base 3-nerved. Fls. small in term. panicled spikes. Fls. a 3-lobed capsule, ½-¾ in. diam. covered with a bright red powder.

Fls. *Sep.-Dec.*; fr. *Nov.-Mar.*; evergreen.

Fairly common along the banks of streams and in moist places throughout the area.

The red powder on the fr. capsules is used for dyeing and for making the red caste-marks of Hindus.

497. **Homonoia riparia**, *Lour.* F. B. I. v. 455; Br. 593; G. 622; C. ii. 620; Watt iv. 263. Vern. *Surra* (Jub.); *Bersi* (Ni.).

A large willow-like shrub; branchlets young leaves and inflorescence hairy. Leaves alt., linear-lanceolate, acute, 4-10 in. long, sec. nerves 10-30 pr. Fls. in ax. spikes 2-5 in. long. Capsule globose, ⅛ in. diam., tomentose.

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Fls. *Mar.-Apr.*; fr. *May.-Sep.* Decidous—(Haines). In rocky river-beds. Jub.; S. Man.; Hosh. (Bori Res.); Bet.; Ni. (Tapti river); Mel.

498. **Baliospermum axillare,** *Bl.* F. B. I. v. 461; Br. 583; G. 624; C. ii. 608; Watt i. 364. Vern. *Hansia dafar* (Jub.); *Boa* (Berar); *Danti, jangli jamalgota* (Mel.)

A stout undershrub with numerous herbaceous branches from the root. Leaves alt., very variable in shape, the upper usually small, lanceolate, the lower large and broad, up to 10 in. diam. variously lobed and sinuate-toothed, 3-5 nerved at the 2-glandular base. Fls. small, greenish-yellow, in ax. racemes or contracted panicles. Capsule obovoid, $\frac{1}{3}$-$\frac{1}{2}$ in. long, pubescent.

Fls. and fr. *Dec.-Mar.*; sub-deciduous or dying down to the root in *Mar.*

In waste places. Jub.; Ni.; Mel. (Chikalda); Yeo.; Bul. Common in fields and waste places all over Berar—(Dickinson).

The stems are used as a remedy for toothache—(Hole).

The following non-indigenous species are cultivated:—

499. **Ricinus communis,** *Linn.* F. B. I. v. 457; Br. 593; G. 622; C. ii. 627; Watt vi. pt. i, 506. Vern. *Arand* (Hin.—N. C.); *Irandi* (Mar.—B. C.). The Castor-oil plant.

A small soft wooded tree with palmately-lobed leaves and large prickly capsules, noticeable in almost every villager's back yard. In Assam the leaves are used for feeding the Eri silk-worm.

500. **Euphorbia pulcherrima,** *Willd.* F. B. I. v. 239; G. 591; C. ii. 570; Watt iii. 299. Poinsettia.

An unarmed shrub with bright crimson floral leaves in the cold weather after the foliage has fallen. A native of America; common in gardens.

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501. **Pedilanthus tithymaloides,** *Poit.* F. B. I. v. 239; C. ii. 626. Vern. *Nagphani, nagdaman* (Jub.; Seo.).

A succulent shrub with fleshy leaves and a scarlet slipper-shaped involucre. A native of S. America. Commonly planted as a border in gardens.

502. **Acalypha marginata,** *Spreng. C.* ii. 612.

A shrub with variegated brown and red leaves, common in gardens. A native of the Fiji Islands.

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503. **Holoptelea integrifolia,** *Planch.* F. B. I. v. 481; Br. 595; G. 628; C. ii. 629; Watt iv. 261. Vern. *Chirhol* (Hin.—Jub.; Sau.; Hosh.; Ni.; Bet.); *Chilwal* (Ni.; Bet.); *Chilla* (Mel.); *Karanjalam* (Kur.—Mel); *Karanji* (Hin.—Chin.).

A large tree with light coloured bark, smooth when young, flaky when old. Leaves alt., elliptic, 3-5 in. long, glabrous. Fls. small, green, in lateral fascicles or short racemes. Fr. flat, orbicular, surrounded by a membranous wing.

Fls. *Feb.-Apr.*; fr. *Mar.-May*; leaves fall, *Feb.-Mar.*; leaves renewed, *Apr.-May*.

Fairly common. Jub.; Sau. (frequent); Hosh.; Ni.; Chin.; Bet.; Mel. and probably in other Divisions.

The wood is not made use of. The leaves are lopped for cattle fodder, and an oil is extracted from the seed in the Melghat—(Gamble).

504. **Celtis tetrandra,** *Roxb.* F. B. I. v. 482; Br. 596; G. 630; Watt ii. 244. Vern. *Ajan* (S. Man.); *Andia* (Gond.—Seo.).

A small tree or large shrub with grey bark. Leaves alt. ovate, acuminate, 2-4 in. long, serrate, base very oblique, 3-nerved, glabrous or pubescent beneath. Fls. small, solitary, or in clusters on long ax. peduncles. Fr. ovoid or globose, ½ in. long, black when ripe.

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Fls. *Feb.-Mar.*—(Hole) ; fr. *Nov.-Dec.* (S. Man.) ; leaves fall, *Dec.-Jan.* ; leaves renewed, *Feb.-Mar.*

Fairly common on the banks of streams in the trap country, Jub.—(Hole). Elsewhere it appears to be rare. I have obtained specimens from S. Man. (Amarkantak) ; Hosh. (Pachmarhi) and Seo. Kenny reports only having seen it once at Chabi, Jagmandal R., S. Man. In S. India it grows to a large size.

The wood is tough and strong and suitable for oars, tool handles, etc. In Assam it is used for planking and canoes.

505. **Trema orientalis,** *Bl.* F. B. I. v. 484 ; Br. 597 ; G. 630 ; C. ii. 631 ; Watt vi. pt. iv, 75. Vern. *Andia, kursa* (Jub.) ; *Pottur* (Bori, Hosh.) ; *Dandanni* (S., Man.); *Khudaibidi* (Mel.) ; *Thoar* (Kur.—Mel.).

A small fast growing tree, 15-25 ft.; branchlets pubescent. Leaves alt., ovate, acuminate, 3-6 in. long serrulate, base unequal sided, cordate, more or less rough above, grey pubescent beneath. Fls. in short ax. cymes. Fr. a very small black drupe ⅛ in. diam.

Fls, and fr. *Nov.-Apr.*

Widely distributed but not common ; Jub., Hosh. (Bori Res.; Pachmarhi) ; Bet. (Kamla) ; S. Man. (Ramnagar) ; Ni. (Sundardeo) ; Mel. (Very common in the interior.)

The wood is said to make good charcoal for the manufacture of gunpowder.

506. **Trema politoria,** *Planch.* F. B. I. v. 484 ; Br. 597 ; G. 631. Vern. *Andia* (Jub.) ; *Jilmili* (Jub. ; Seo. ; Chin. ; Hosh.) ; *Majni* (Jub ; Seo. ; Sau.) ; *Dandanni* (S. Man.) ; *Thoar* (Kur.—Mel.).

A small tree with rough brown bark, resembling the preceding, but the leaves are oblong-lanceolate, less acuminate, and very rough on both surfaces. Fls. and fr. as in preceding.

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Fls. *July-Sep.*; fr. *Nov.-Jan.*: evergreen, new shoots and leaves *Feb.* (Sau.).

Widely distributed, commoner than *T. orientalis*, but local. Usually on clearings, fresh road cuttings and embankments. Jub.; Sau. (Basa Res., Chandapur Res.); Chin. (Umreth R.); S. Man.; Seo.; Hosh.; Ni.; Yeo. (Ganganmal Res.); Mel. (common in foothills W. of Jamgarh).

The leaves are used as a substitute for sand-paper to polish wood, etc.

507. **Streblus asper,** *Lour.* F. B. I. v. 489; Br. 615; G. 632; C. ii. 642; Watt vi. pt. iii, 373. Vern. *Majni* (Jub.).

A shrub or small gnarled tree, all parts full of milky juice. Leaves alt. elliptic or obovate, acute or acuminate, 2-4 in. long, irregularly dentate, rough on both surfaces. Fls. the ♂ in small globose heads, the ♀ solitary. Fr. a small yellow fleshy berry, enclosed in the enlarged perianth.

Fls. *Mar-May*; fr. *May-June*.

This has only been found so far in Jub. I have seen no specimens. It will probably be found eventually in some of the Berar Divisions.

The leaves are used to polish wood; the twigs are used for tooth-brushes and the milky juice is used in native medicine.

508. **Ficus gibbosa,** *Bl.*, *var.* parasitica, *King.* F. B. I. v. 496; Br. 599; G. 637; C. ii. 644; Watt iii. 351. Vern. *Majni* (Hin.—Jub.; Seo.; Chin.; S. Man.).

A small tree often epiphytic or climbing. Leaves alt. sub-rhomboid, 3-6 in. long, base unequal-sided, more or less scabrid on both surfaces, 3-5 pr. prominent sec. nerves. Fr. stalked, almost globose, ½ in. diam., yellow when ripe.

Fls. and fr. *Nov.-Apr.*

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Usually on old walls and trees. Jub.; S. Mr. (Karanjia); Chin. (Sillewani R.); Seo.; Bet.; Hosh. (Pachmarhi).

The root bark is employed in native medicine.

509. **Ficus bengalensis,** *Linn.* F. B. I. v. 499; Br. 600; G. 638; C. ii. 645; Watt iii 343. Vern. *Bar, bargat* (Hin.—N.C.; Ni.; Bet.); *War, wad* (Mar.—Berar); *Wora* (Kur.—Mel). The Banyan.

A very large tree, with numerous aerial roots from the branches, which under favourable circumstances become trunks extending the growth of the tree indefinitely. Leaves alt. approximate near the ends of branches, ovate, 4-8 in. long, obtuse, base sub-cordate, glabrous or minutely pubescent beneath. Fr. globose, pubescent, $\frac{1}{2}$-$\frac{3}{4}$ in. diam, sessile, scarlet when ripe.

Fls. and fr. *Dec.-Feb.* and *Apr. May.* Almost evergreen, leaves renewed *Apr.*

Common in all Divisions; frequently planted near villages on account of the shade it affords.

The fr. is much sought after by birds and is eaten by the poorest classes in famine years. The leaves and branches are used as elephant fodder.

510. **Ficus tomentosa,** *Roxb.* F. B. I. v. 501; Br. 601; G. 640; C. ii. 646 Vern. *Chitakar* (Jub.); *Son pakar* (Seo.); *Katbar* (Sau.; Chin.).

A large or small tree with thin aerial roots from the branches; branchlets, petioles, and underside of leaves clothed with rusty-grey woolly tomentum. Leaves usually crowded near ends of branches, ovate or ovate-oblong, 3-7 in. long, base cordate, glabrous above, sec. nerves 5-7 pr. prominent beneath. Fr. globose, $\frac{1}{4}$ in. diam., sessile, grey tomentose.

Fls. and fr. *Sep.-Dec.*; practically evergreen.

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In rocky dry situations. Jub. ; Seo. ; Sau (common on the steep sandstone cliffs at Garhpehra, Ranipura Res. ; Rangir Res.) ; Chin. (Sillewani R.).

511. **Ficus mysorensis,** *Heyne*. F. B. I. v. 500 ; Br. 601 ; G. 638 ; C. ii. 645 ; Watt iii 356.

A large tree with grey rough bark ; young shoots, petioles and underside of leaves clothed with dense soft grey or tawny tomentum, when mature nearly glabrous. Leaves elliptic, shortly acuminate, 3 8 in. long, base cordate, sec. nerves 10-15 pr. Fr. ovoid or oblong, sessile, pubescent, 1 in. long.

Fr. *Apr.-May*.

Only reported from Hosh. (Pachmarhi) by Donald. I have not seen any specimens.

512. **Ficus glaberrima,** *Bl.* F. B. I. v. 506 ; Br. 600 ; G. 640.

A large tree or epiphytic shrub, as a rule glabrous. Leaves oblong-lanceolate, acuminate, 5-7 in. long, base acute, sec. nerves 8-10 pr., the lowest pr. basal and near the edge of leaf. Fr. ¼ in. diam., orange coloured when ripe, on slender peduncle as long as fr.

Specimens from Hosh. (Dhupgarh, Pachmarhi), collected by Duthie are in the collection at Dehra Dun.

513. **Ficus retusa,** *Linn.* F. B. I. v. 511 ; Br. 603 ; G. 643 ; C. ii. 647 ; Watt iii. 360. Vern. *Paraspipal* (Ni.).

A moderate sized or small tree, often epiphytic. Leaves coriaceous, elliptic or obovate, 1½-3 in. long, apex rounded or shortly acuminate, dark green, shining, base narrowed into petiole, sec. nerves very slender. Fr. depressed globose, ¾ in. diam., smooth, sessile, yellow when ripe.

Fls. and fr. *Feb.-May*. Evergreen ; new shoots *Apr.*

Along the banks of rocky nalas and on steep cliffs, Sau. (Rangir Res.) ; Hosh. (Pachmarhi) ; Ni. (Chand.

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garh Res.), Am.; Mel. Sometimes planted as a road-side tree on account of the shade it affords.

The root and root bark are used to apply to wounds.

514. **Ficus religiosa,** *Linn.* F. B. I. v. 513; Br. 601; G. 644; C. ii. 649; Watt iii. 357. Vern. *Pipal* (Hin.—N. C.; B. C.); *Pipri* (Kur.—Mel.); *Ali* (Gond.—Jub). The Peepul tree.

A large wide spreading glabrous tree with smooth light grey bark, usually epiphytic when young. Leaves broad ovate, the apex produced into a long caudate tip, $\frac{1}{3}$ length of the whole leaf, base 5-7 nerved. Fr. sessile, $\frac{1}{2}$ in. diam., smooth, purple when ripe.

Fls. and fr. *Oct.-Dec.* and also *Feb.-Apr.*; leaves fall, *Feb.-Mar.*; leaves renewed, *Apr.-May.* (Hole says *Jan.-Apr.*).

Common in all Divisions, frequently on old buildings. The tree is sacred to both Hindus and Buddhists and is commonly planted near shrines.

The fr. is much eaten by birds. The leaves and branches are lopped for camel and elephant fodder.

515. **Ficus Arnottiana,** *Miq.* F. B. I. v. 513; Br. 602; G. 638; C. ii. 649. Vern. *Gadani pipli* (Kur.—Mel.).

A large tree (Donald) with smooth grey bark, darker than that of preceding. Leaves broadly ovate-cordate, 4-7 in. long, resembling those of *F. religiosa*, but with only a $\frac{1}{4}$ in. tail. Fr. often peduncled, $\frac{1}{4}$-$\frac{1}{3}$ in. diam., in pairs or densely clustered.

Fls. and fr. *Mar.-June*; deciduous *Apr.*—(Haines).

On rocks and dry hills, often epiphytic. Mel. (Gugamal R., chiefly on the higher rocky hills).

516. **Ficus Tsiela,** *Roxb.* F. B. I. v. 515; Br. 603; G. 645; C. ii. 650; Watt iii. 362.

A low or large spreading tree, often epiphytic, sometimes sending down aerial roots from the branches;

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bark smooth, greenish-white. Leaves coriaceous, ovate, acute, 2-6 in. long, base cuneate or rounded, sec. nerves 8-12 pr., the lower pr. basal; petiole slender. Fr. globose, pyriform from a broad base, ½ in. diam., sessile, in pairs, ax. or from the leaf scars, smooth, purple when ripe.

Fls. and fr. *Dec.-Mar.*

Usually on alluvial soil, Sau. (Suna ; Deori R.) ; Mel. ; Ni. (Samardeo Res.) ; Bul. (common on the outer slopes of Ambabarwa Res.). Probably also in other Divisions, but overlooked owing to its strong resemblance to the following species :—

517. **Ficus infectoria,** *Roxb.* F. B. I. v. 515 ; Br. 602 ; G. 645 ; C. ii. 651 ; Watt iii. 355. Vern. *Pakar* (N. C. ; Ni. ; Am. ; Mel.) ; *Pakhri* (S. Man.) ; *Pipri* (Mel. ; Ni.) ; *Piprani* (Am. ; Bul.) ; *Pheparni* (Yeo.) ; *Phepar* (Bet.).

A large tree, epiphytic when young, with smooth grey bark. Leaves membranous, thinner than in *F. Tsiela*, ovate or ovate-oblong, acuminate, 3-6 in. long, glabrous, base rounded or sub-cordate, sec. nerves 5-8 pr., the lower pr. basal, looping within the margin, more prominent than in *F. Tsiela* ; petiole stout. Fr. globose, ¼ in. diam., sessile or more often shortly stalked, ax. in pairs, white or flushed with red.

Fls. and fr. *Dec.-June*—(Haines) ; *Sep.* (Sau.) ; *Oct.-Nov.* (Mel.) ; leaves fall, *Jan.-Feb.* ; leaves renewed, *Mar.-Apr.*

Common in all Divisions. Frequently planted as an avenue tree on account of its rapid growth.

The leaves and fr. are eaten in times of scarcity. The leaves make good elephant fodder.

518. **Ficus hispida,** *Linn.* F. B. I. v. 522 ; Br. 606 ; G. 647 ; C. ii. 653 ; Watt iii. 354. Vern. *Katumar* (Hin.—N. C. ; Ni.) ; *Katumbar* (Mar.—Yeo. ; Am.) ; *Katgular*

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(Hin.—Chin.); *Chandurtoya* (Gond.—Seo.); *Korelawa* (Kur.—Mel.); *Kala umar* (Hosh.); *Bhohi umar* (Yeo.).

A large shrub, rarely a small tree. Leaves usually opp., ovate-oblong, 4-12 in. long, entire or dentate, scabrid above, clothed beneath with short stiff hairs. Fr. obovoid, 1 in. long, green, usually clustered on long leafless panicles hanging from the trunk and branches; on young plants often in ax. pairs.

Fls. and fr. *Jan.-Apr.*; sometimes leafless *Apr.*

In all Divisions in moist places and along perennial streams.

The fr., seeds and bark possess valuable emetic properties.

519. Ficus Cunia, *Ham.* F. B. I. v. 523; Br. 606; G. 648; Watt iii., 349. Vern. *Korelawa* (Mel.); *Ghwi* (S. Man.).

A small or middle sized tree. Leaves alt. oblong, with the lower half of the base much enlarged, semi-cordate, rough above, pubescent beneath, 6-15 in. long; petiole very short. Fr. in pairs or clusters on long leafless branches from the trunk especially near the root.

Fls. and fr. *Oct.-Nov.* Evergreen.

On the banks of streams and in ravines; not common. Mel.; S. Man. (Karanjia; Banjar R.).

The fr. is eaten.

520. Ficus scandens, *Roxb.* F. B. I. v. 526; Br. 609; G. 648; C. ii. 654. Vern. *Pakar* (Jub.).

A large climbing shrub, rooting at the nodes. Leaves ovate, 3-5 in. long, sec. nerves 4-6 pr., prominent, the lowest pr. basal. Fr. globose, solitary or in prs., ½ in. diam., on short peduncles.

Only reported from Jub. by Hole. It is a plant of the sub-Himalayan tract and not likely to be found in this area wild. It is occasionally cultivated in gardens.

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521. **Ficus palmata,** *Forsk.* F. B. I. v. 530 ; Br. 607 ; G. 649 ; Watt iii. 357. Vern. *Anjir* (Sau.) ; *Taroh* (S. Man.).

A small tree, bark smooth, grey ; branchlets, petioles, and underside of leaves soft tomentose Leaves broad ovate, 3-5 in. long, dentate, or deeply 3-5 lobed, base truncate or cordate, rough above. Fr. ax., pear-shaped, ½ in. diam., yellow when ripe, peduncle ½-1 in.

Fls. and fr. *Aug.*, also *Feb.-Mar.* Evergreen (?).

This is a species of N.-W. India, but to all appearance wild in this area. Sau. (Rahatgarh Res. ; Jamania Gond, in a well ; Gorjhamar) ; S. Man. (Dindori R.) ; Chin. (Amarwara R.) ; Jub.

It is cultivated in the Punjab for its fruit.

522. **Ficus glomerata,** *Roxb.* F. B. I. v. 535 ; Br. 609 ; G. 650 ; C. ii. 654 ; Watt iii. 351. Vern. *Umar* (Hin.—Jub. ; Sau. ; Seo. ; S. Man. ; Chin. ; Dam.) ; *Gular* (Hin.—Jub. ; Sau. ; Chin. ; Hosh. ; Am. ; Ni. ; Bet. ; Yeo.) ; *Umbar* (Mar.—Berar) ; *Lawa* (Kur.—Mel.) ; *Toya* (Gond.—Jub. ; Seo.).

A middle sized or large tree, with thick crown. Leaves ovate, or elliptic-lanceolate, 3-7 in. long, glabrous, sub-acute, base usually rounded, 3-nerved. Fr. nearly globose, 1-1½ in. diam., pubescent, clustered on leafless branches from the trunk and larger branches.

Fls. and fr. *May-June* ; semi-deciduous, leaves usually fall *Nov.-Dec.* and are renewed *Jan.-Feb.* Common in all Divisions, generally near water.

The leaves are lopped for fodder and the fr. is eaten.

523. **Bœhmeria platyphylla,** *Don.* F. B. I. v. 578 ; Br. 617 G. 658 ; Watt i. 483.

A large shrub. Leaves mostly opp. broadly ovate, acuminate, 5-10 in. long, coarsely toothed, rough on both surfaces, 3-nerved at the base. ♂ fls. minute, in clusters on long sub-erect spikes, up to 16 in. in length. ♀ fls. in short spreading spikes 2-3 in. long.

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Fls. *Oct.-Jan.*

Not common. S. Man. (Amarkantak, 3000 ft.); Hosh. (Chunna).

The following non-indigenous species are sometimes cultivated :—

524. **Morus lævigata**, *Wall.* F. B. I. v. 492; Br. 613; G. 636; C. ii. 658; Watt v. 284. Vern. *Atut*, *tut*.

A small tree with ovate shortly acuminate serrate leaves, and cylindric yellowish-white fr.

Fls. *Jan.-Mar.*

Planted as a roadside tree, and cultivated for its fr.

525. **Ficus Carica**, *Linn.* F. B. I. v. 530. Br. 607; G. 637; C. ii. 655; Watt iii. 347. Vern. *Anjir*. The Fig.

A shrub with cordate more or less deeply lobed leaves, upper side rough. Fr. pear-shaped, 2 in. diam. Cultivated for its fr.

526. **Artocarpus integrifolia**, *Linn.* F. B. I. v. 541; Br. 611; G. 652; C. ii. 657; Watt i. 330. Vern. *Kathar* (Jub.; Sec.); *Phanas* (Mar.—Chin.). The Jack fruit.

A large evergreen tree with alt. elliptic or obovate acuminate leaves, and large fruit 12-30 in. by 6-12 in. hanging on short stalks from the trunk. Cultivated in gardens for its fr.

527. **Artocarpus Lakoocha**, *Roxb.* F. B. I. v. 543; Br. 612; G. 655; C. ii. 657; Watt i. 333. Vern. *Barhar*.

A middle sized deciduous tree with coriaceous elliptic entire leaves, and fleshy sub-globose fr., yellow when ripe.

Cultivated in gardens for its fr. Indigenous in the outer Himalayas, Assam, Bengal, Burma, etc.

CASUARINACEÆ.

528. **Casuarina equisetifolia**, *Forst.* F. B. I. v. 598; Br. 620; G. 665; C. ii. 660; Watt ii. 230. Vern. *Surra* (Jub.).

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A tall straight stemmed leafless tree with cylindric deciduous branchlets, and the appearance of a Pine tree.

Fls. *Feb.-Mar.*

Cultivated in gardens and occasionally as a roadside tree. Indigenous in Bengal on the coast, Malay Archipelago, Australia.

Very valuable for reclaiming stretches of sand on the East coast, where it is much used for fuel.

SALICACEÆ.

529. **Salix tetrasperma,** *Roxb.* F. B. I. v. 626; Br. 636; G. 685; C. ii. 661; Watt vi. pt. ii, 391. Vern. *Bainsa* (Hin.—Jub.; Chin.; S. Man.); *Binjari* (S. Man.); *Baiosa* (Hin.—Sau.; Hosh.); *Bed* (Hin.—Mel.); *Walung* (Mar.—Berar).

A small tree or large shrub with rough fluted bark. Leaves alt., lanceolate, acuminate, 1½-3 in. long, minutely serrate, pale glaucous beneath. Fls. in drooping catkins, male catkins 2-4 in. long, female catkins 3-5 in. Seeds enclosed by a mass of white silky hairs conspicuous on the tree in fr.

Fls. *Oct.-Jan.*; fr. *Dec.-Mar.*; deciduous.

Not uncommon and in places gregarious along perennial streams. Jub.; Sau. (Branj nadi); S. Man. (Nerbudda river); Hosh. (Bori Res.); Chin.; Mel.; Bul.; Bet.; Ni.

The twigs are used for basket-making.

ORCHIDACEÆ.

530. **Pachystoma senile,** *Reichb. f.* F. B. I. v. 812. Vern. *Safed musli* (S. Man.); *Kurkutti* (Baiga—S. Man.).

A small herb with underground rhizome, from which arises an erect flower scape 8-15 in. long with one solitary very long and narrow leaf at the base. Fls. on scape, racemose, greenish white, ⅛ in. long, bracteate.

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Fls. *Apr.* (?).

In swampy places on high plateaux, S. Man. (Karanjia R., 3,000-3,300 ft.)

The rhizomes are collected and sold for medicinal purposes.

SCITAMINACEÆ.

531. **Musa superba,** *Roxb.* F. B. I. vi. 261; G. 723; C. ii. 740; Watt v. 302; Bombay Natural History Society's Journal, Vol. XV, p. 586. Vern. *Jangli kela* (Mel.). The Wild Banana.

A tree-like herb, 10-12 ft., with thick cylindrical stem composed of convolute leaf sheaths. Leaves 5-10 ft. long by 2-3 ft., oblong, narrowed to the base. Fls. purple in drooping spikes, the lower female, the upper male. Fr. oblong sub-coriaceous, 3 in. long, nearly dry when ripe.

On the higher hills of the Mel., 1,500-3,000 ft.

The tuberous root-stock and sheathing leaf-stalks are eaten.

A wild plantain is reported from ravines in the Maikal R., S. Man., but I have not seen specimens.

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532. **Musa sapientum,** *Linn.* F. B. I. vi. 262; C. ii. 742; Watt v. 290. Vern. *Kela.* The Plantain or Banana.

Commonly cultivated for its fruit.

AMARYLLIDACEÆ.

533. **Curculigo orchioides,** *Gaertn.* F. B. I. vi. 279; C. iii. 748; Watt ii. 650. Vern. *Kali musli, Kali musri* (Hin.—Chin.; Sau.).

A small herb with tuberous root-stock and fleshy root fibres. Leaves sessile, radicle, linear-lanceolate, plicate, 6-12 in. long. Fls. bright yellow, star-shaped, just above the ground. Capsule ½ in. long, beaked.

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Fls. *June-Aug.*; appears in the rains and dies down in the cold season.

On marshy ground. Chin. (Amarwara R.); Ni. (common); Sau. and probably in all Divisions.

The tubers are used in medicine, and in the S. Circle are often included in leases of "Minor Forest Produce."

DIOSCOREACEÆ.

534. **Dioscorea dæmona,** *Roxb.* F. B. I. vi. 289; C. ii. 756; Watt iii. 129. Vern. *Baichandi* (Hin., Mar.—N. C.; B. C.); *Bhuikand* (Mar.—B. C.); *Chan* (Sau.; Dam.); *Kulu* (Kur.—Mel.; Bul.).

A climbing herb with stout more or less prickly stems. Leaves alt. 3-foliolate; common petiole 4-8 in. long; leaflets obovate, caudate-acuminate, 3-5 nerved, the lateral leaflets very oblique. ♂ fls. in dense short spikes, in clusters along a 1-2 ft. long rachis. Capsule 1½ in. long, triquetrous.

Fls. *July-Sep.*; fr. *Sep.-Dec.*; appears with the rains and dies down about *Dec.*

Common in all Divisions.

The tuberous root, which is sub-globose and lobed, is edible after being soaked in running water which dissolves the poisonous matter. The tubers are collected by forest tribes, and are much valued in famine times.

535. **Dioscorea pentaphylla,** *Linn.* F. B. I. vi. 289; C. ii. 757; Watt iii. 132. Vern. *Suarkand* (Hin.—Jub.; Sau.; Ni.; Chin.); *Babra* (Mar.—Berar); *Babra* (Kur.—Mel.).

A climbing herb with slender stems prickly at the base. Leaves 3-5 foliolate; common petiole 1-2½ in. long; leaflets elliptic-lanceolate to obovate, acuminate, not basal nerved. ♂ fls. in short racemes, solitary or in fascicles along branches of a panicle

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6-12 in. long. Capsule as in preceding, but only ¾-1 in. long.

Fls. *Aug.-Oct.*; fr. *Oct.-Jan.*; appears with the rains and dies down about *Jan.*

Fairly common in hilly localities, Jub.; Sau.; Chin.; (Amarwara R.); Am.; Bul.; Mel.; Ni.; but no doubt in all Divisions.

The tubers which are oblong, and 2-3 ft. in length, are eaten by the poorer classes.

536. **Dioscorea bulbifera,** *Linn.* F. B. I. vi. 296; C. ii. 758; Watt iii. 128. Vern. *Agitha* (Hin.—Jub.; Chin.; S. Man.; Sau.; Dam.); *Karukand* (Hosh.); *Gathalu* (Jub.; Chin.; B. C.); *Gharialu* (Jub.); *Gogdu* (Bul.); *Bayal* (Mel.); *Mataru* (Mar.—Chin.).

A climbing herb with large globose tubers; stem unarmed, glabrous. Leaves simple, opp. and alt. broadly ovate-cordate, acuminate, 3-10 in. long, with 10-12 conspicuous nerves from the base, joined by parallel cross-nerves. Axils of leaves often bear small brown bulbs. Fls. green or purplish, in short slender spikes on long pendulous racemes. Capsule triquetrous, fleshy, 1 in. long.

Fls. *July-Sep.*; fr. *Oct.-Dec.*; appears with the rains and dies down about *Dec.*

Common in all Divisions.

The tubers are edible after washing in running water. A useful famine food.

537. **Dioscorea aculeata,** *Linn.* F. B. I. vi. 296; Watt iii. 125.

A climber with somewhat angular stems. Leaves simple, opp. and alt., broadly ovate-cordate, cuspidate, glabrous, 9 main nerves; petioles thick and hard at the base. Capsule 1½ in. diam., broader than long. Reported from Mel. (Chikalda, 3,500 ft.,) by Donald.

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The tubers are elongate, 1-3 ft. long, and being very palatable this species is commonly cultivated in Bombay and Madras.

538. **Dioscorea oppositifolia,** *Linn.* F. B. I. vi. 292; C. ii. 758; Watt iii. 132. Vern. *Bilaikand* (Jub.; Sau.; Dam.); *Dardi* (Berar; Ni.); *Morikand* (Chin.; Hosh.).

A large climbing herb with smooth stems, and large oblong tubers, 1-2 ft. long. Leaves opp. rarely alt. ovate-oblong, 2-5 in. long, glabrous, base rounded, 3-5 nerved, with a conspicuous cartilaginous margin. Male fls. in short dense spikes fascicled along a slender ax. rachis, 4-10 in. long. Capsule almost orbicular, 1-1½ in. across.

Fls. *Sep.-Oct.*; fr. *Nov.-Dec.*; appears in the rains, dying down about *Jan.*

In hilly localities. Jub.; Sau; Dam.; Hosh. (Malni); Chin.; Am.; Bul.; Mel.; Ni. and probably in all Divisions.

The tubers are eaten.

With this species may be included **D. glabra,** *Roxb.*, reported from Jub.

The following are commonly cultivated :—

539. **Dioscorea alata,** *Linn.* F. B. I. vi. 296; C. ii. 759; Watt. iii. 131. Vern. *Rathalu* (Jub.).

A large climber with very large tubers and quadrangular and winged stems. Leaves opp. broadly ovate-cordate.

The tubers are eaten as a vegetable by Europeans and natives.

540. **Dioscorea fasciculata,** *Roxb.* F. B. I. vi. 296; C. ii. 759; Watt iii. 125. Vern. *Mahabri, pinoh* (Jub.).

Smaller than preceding, leaves pubescent, orbicular-cordate, with sharp stipule-like spines.

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541. Gloriosa superba, *Linn.* F. B. I. vi. 358 ; G. 724; C. ii. 766 ; Watt iii. 506. Vern. *Kirkichiyao* (Sau.); *Karihari* (Ni.); *Karkari* (Bet.); *Kallavi* (Mar.—Berar).

A herbaceous climber with tuberous root-stock. Leaves opp. ovate-lanceolate, acuminate, the tip ending in a tendril-like spiral by which the plant supports itself. Fls. large, very handsome, perianth segments bright red and golden yellow mixed, with wavy margins. Capsule linear-oblong, 1½ in. long.

Fls. *Aug.-Sep.* ; fr. *Sep.-Oct.* ; appears with the rains and dies down in *Nov.*

Common in hedges, chiefly on black soil throughout the area.

The tuberous root is believed in Madras to be a specific against snake-bite and scorpion-stings.

542. Smilax macrophylla, *Roxb.* F. B. I. vi. 310 ; Br. 641 ; C. ii. 763 ; Watt vi. pt. iii, 255. Vern. *Ramdatun* (Hin.—N. C.) ; *Pothur* (S. Man.).

A large prickly climber. Leaves alt., broadly ovate or orbicular, acuminate, 3-8 in. long, glabrous, shining ; 5-7 basal nerves reuniting at the apex. Fls. small, white, in pedunculate umbels. Fr. a globose berry, red when ripe.

Fls. *June-Aug.* ; fr. *Nov.-Jan.* ; leaves fall, *Dec.-Jan.*

Common throughout the N. C. Also Ni. (scarce) ; Mel.

The stems are used as tooth-brushes. The berries are edible.

543. Asparagus racemosus, *Willd.* F. B. I. vi. 316 ; Br. 642 ; G. 724 ; C. ii. 762 ; Watt i. 345.

Vern. *Sitawar* (Sau. ; Seo. ; Chin.) ; *Sataor* (Jub.) ; *Satawari* (Mar.—Mel. ; Ni. ; Am.) ; *Jogilati* (?) (S. Man.) ; *Narbodh* (Chin.).

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A slender scrambling and climbing spinous under-shrub, with annual woody shoots, and tufts of needle-like branchlets in place of leaves. Fls. white, fragrant, in racemes 2-6 in. long. Fr. a small globose red berry.

Fls. *Sep.-Nov.* ; fr. *Oct.-Dec.*

Not uncommon, in all classes of forest. Jub. ; Seo. ; Sau. ; Chin. ; S. Man. ; Ni. ; Mel. ; Bul. ; Am. and probably in all Divisions.

The root is used medicinally, as a stimulant.

PALMÆ.

544. **Phœnix sylvestris,** *Roxb.* F. B. I. vi. 425 ; Br. 645 ; G 731 ; C. ii. 801 ; Watt vi. pt. i, 208. Vern. *Khajur, kajuri* (Hin.—N. C.) ; *Shindi* (Mar.—B.C.) ; *Sindhi* (Mel. ; Ni.). Wild Date Palm.

A tall erect tree, the trunk covered with the bases of the leaf-stalks. Leaves pinnate, 7-12 ft. long. Male inflorescence, white, scented, on a short peduncle. Fr. 1-1¼ in. long, ellipsoid, orange-yellow, edible.

Fls. *Mar.-May* ; fr. *Sep.-Oct.*

Indigenous and not uncommon along the banks of streams and in low-lying ground, in many parts of the B. C. It is however commonly cultivated and found run wild so that it is difficult to distinguish between indigenous and introduced specimens. Throughout the area.

The tree is tapped for its sugary juice which is converted into liquor. Mats and baskets are made from the leaves.

545. **Phœnix acaulis,** *Buch.* F. B. I. vi. 426 ; Br. 645 ; G. 730 ; C. ii. 802 ; Watt vi. pt. i, 199. Vern. *Kucha chind* (Jub. ; Chin.) ; *Chind* (Seo. ; Sau. ; S. Man.) ; *Juna* (Mel.) ; *Jangli khajur* (Ni.).

A dwarf palm, stem hardly any, or thick and ovoid, covered with persistent leaf bases. Leaves pinnate

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2-6 ft. long, base thickened ; lowest leaflets reduced to sharp spines. Fruiting peduncle short included in the spathe. Fr. ½ in. long, black when ripe, edible.

Fls. *Apr.-May* ; fr. *May-June*.

In open grassy areas. Sal forests of the Satpura hills (Brandis); Jub. ; Sau. ; Chin. ; S Man. ; Ni. ; Mel. and probably in all Divisions.

The tender white peduncle is eaten. The bulbous stem is used as a brush to clean silver ornaments—(Hole).

546. **Phœnix humilis,** *Royle.* F. B. I. vi. 426 ; Br. 645 ; G. 731 ; C. ii. 802. Vern. *Bara chind* (Jub. ; Chin. ; S. Man.) ; *Khajur* (Chin.).

A low palm difficult to distinguish from *P. acaulis.* Stem 0 to 6 ft. densely covered with the bases of the old leaf-stalks, and frequently throwing out numerous root-suckers. Leaves pinnate, 4-8 ft. long ; leaflets softer than in preceding, the uppermost sometimes confluent, base not thickened. Fruiting peduncle 2-4 ft. long. Fr. ½ in. long, orange, then black, edible.

Fls. *Apr.* ; fr. *June.*

The distribution of this species requires further enquiry. It is probably frequently confused with *P. acaulis.* Reported from Jub. ; Chin. ; S. Man. (?) ; Hosh. (Pachmarhi).

The leaves are used for making mats, brooms, etc.

547. **Borassus flabellifer,** *Linn.* F B. I. vi. 482 ; Br. 657 ; G. 737 ; C. ii. 811 ; Watt i. 495. Vern. *Tar* (Hin.—N. C.) ; *Tad* (Mar.—B. C.).

A tall erect tree up to 60 ft. with a crown of large fan-shaped leaves, 3-5 ft. diam., segments 60-80 ; petiole 2-4 ft. long. Fr. sub-globose 6 in. diam. enclosed by the enlarged and partly fleshy perianth.

Fls. *Mar.-Apr.*

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Occasionally cultivated in the N. C., more commonly cultivated in the B. C. and run wild round villages.

The leaf-stalks are tapped for the sugar and toddy they yield. The leaves are used for thatching, mats, etc. The fr. is eaten.

The following non-indigenous species are occasionally cultivated :—

548. **Areca Catechu,** *Linn.* F. B. I. vi. 405; Br. 646; G. 726; C. ii. 809; Watt i. 291. Vern. *Supari.* The Areca Palm.

A graceful slender stemmed palm. Leaves pinnate, 4-6 ft. long. The seeds constitute the Betel-nut of commerce.

549. **Caryota urens,** *Linn.* F. B. I. vi. 422; Br. 654; G. 729; C. ii. 805; Watt ii. 206. The Sago Palm.

A tall palm with very large bi-pinnate leaves. The trees are tapped for toddy. The leaves give a strong fibre which is made into ropes, brooms, baskets, etc.

550. **Pandanus fascicularis,** *Lam.* F. B. I. vi. 485; Br. 659; G. 740; C. ii. 814; Watt vi, pt. i, 5. Vern. *Keora.* Screw Pine.

A shrubby pine with spirally arranged leaves at the ends of the branches.

Planted in gardens.

GRAMINEÆ.

A.—Grasses.

551. **Paspalum sanguinale,** *Lamk.* F. B. I. vii. 13; C. ii. 940; Watt vi. pt. i, 15; B. G. No. 2, Fig. I. Vern. *Phatta* (Hosh.); *Charpatiya* (Seo.); *Safed rai, rai, rayad* (Ak.); *Rayar* (Yeo.); *Rai* (Bet.); *Sika* (Mel.; Bet.); *Sailria, killu* (Ni.).

Annual; stem 2-3 ft., erect from a branching base. Leaves 2-6 in. long, narrow, glabrous. Spikes 2-6 in number, 4-5 in. long, digitate at the end of a long peduncle. Spikelets bearded or almost glabrous.

Fls. and fr. *Sep.-Oct.*

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Common, on a variety of soils, but favours the poorer soils. Scattered, never in large masses. Sau.; Hosh.; Seo.; Ak.; Bet.; Ni; Yeo.; Mel.

A good fodder for horses and cattle.

552. **Panicum colonum,** *Linn.* F. B. I. vii. 32; C. ii. 931; Watt vi. pt. i, 7; B. G. No. 8, Fig. IV. Vern. *Sama* (Hin.—Seo.; Sau.); *Chichbi* (Hin.—Hosh.; Seo.); *Jangli sawan, saweli* (Mel.); *Sawan* (Yeo.); *Shonrel* (Bet.); *Saonria* (Ni.).

Annual; stem 1-2 ft., decumbent. Leaves 4-8 in. long, narrow, dark green. Spikes less than 1 in. long, rather far apart, along a stout erect rachis. Infl. pale green, turning yellowish when ripe.

Fls. and fr. *Sep.-Oct.*

Common in fields on light soil; not a *forest* grass. Sau.; Hosh.; Seo.; Bel.; Yeo.; Mel.; Ni.; and probably throughout the area.

A good fodder grass, best used green. In times of scarcity the seed is eaten in place of the cultivated variety *P. Crus-galli, L.*

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553. **Paspalum scrobiculatum,** *Linn.* F. B. I. vii. 10; C. ii. 943; B. G. No. 7. Vern. *Kodon* (Hin.—N. C.; B. C.).

Widely cultivated by Korkus, Gonds and other jungle tribes, chiefly in hilly localities throughout the area.

554. **Panicum Crus-galli,** *Linn.*, var. **frumentaceum.** F. B. I. vii. 30; C. ii. 931; Watt vi. pt. i. 9; B. G. No. 7. Vern. *Sawan, saweli* (Mel.; Bet.; Ni.); *Bhatta* (Seo.).

One of the cultivated millets, confined to hilly localities, and a common food grain of Korkus and other jungle tribes.

The straw is used extensively in Bet. for fodder.

555. **Panicum miliare,** *Lamk.* F. B. I. vii. 46; C. ii. 939; Watt vi. pt. i, 13; B. G. No. 11. Vern. *Kutki* (Hin.—N. C.; B. C.).

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As frequently cultivated as *kodon* by the Kurkus, Gonds and other jungle tribes in hilly localities throughout the area.

The straw is used as fodder for cattle.

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556. **Setaria glauca,** *Beauv.* F. B. I. vii. 78; C. ii. 920; Watt vi. pt. ii, 546; B. G. No. 14, Fig. VII. Vern. *Kolua, koluwa* (Seo.); *Kolia* (Bet.; Mel.; Ni.); *Kuloo jara* (Kur.—Mel.).

Annual; not over 1 ft. high, branched and decumbent below. Leaves very narrow, 2-4 in. long. Infl. a cylindric dense terminal spike, 2-3 in. long, with numerous brown or yellow bristles rising from the pedicels of the spikelets.

On hilly ground, frequently coming up in *kodon* and *kutki* fields. Sau.; Hosh.; Seo.; Bet.; Mel.; Ni., and probably throughout the area.

Not very highly valued as fodder, but suitable for grazing.

557. **Pennisetum Alopecuros,** *Steud.* F. B. I. vii. 84; C. ii. 914; Watt vi. pt. i, 127; B. G. No. 17. Vern. *Moya* (Hin.—Sau.; Dam.; Hosh.; Seo.; Mel.); *Mohada* (Mel.); *Mole* (Ak.).

A coarse perennial grass, 2-3 ft. high, growing in tufts, with very long narrow leaves rolled up from the sides. Infl. a pale greenish-coloured bristly spike 5-7 in. long.

Fls. and fr. *Oct.-Nov.*

On marshy ground and along the edges of tanks and nalas. Sau.; Dam.; Hosh.; Seo.; Mel.; Ak., and probably in all Divisions.

This grass is of no value as fodder, or for grazing, but is commonly used for making rope.

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558. **Coix Lacryma-Jobi,** *Linn.*, var. **gigantea,** *Roxb.* F. B. I. vii. 100; C. ii. 997; Watt ii. 492; B. G. No. 21. Vern. *Garru* (Sau.; Bet.); *Gurlu* (Seo.); *Kosar* (Yeo.); *Kasad* (Ak.).

A large perennial grass, 5-8 ft. high. Leaves 4-18 in. long, tapering from a broad cordate base to an acuminate tip. Infl. of nodding or drooping purplish racemes which when ripe are conspicuous on account of the shiny bluish-grey globose seeds, well known as Job's Tears.

Fls. and fr. *Sep.-Oct.*

Common in low-lying wet localities along nalas and the edges of tanks throughout the area.

Buffaloes will eat it but it is seldom touched by other animals. The seed is eaten by the poorer classes in times of scarcity.

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559. **Oryza sativa,** *Linn.* F. B. I. vii. 92; C. ii. 1043. Watt v. 498; B. G. No. 20. The Rice-plant. Vern. *Dhan.*

Cultivated to some extent in both circles. The straw is used as fodder for cattle.

560. **Zea Mays,** *Linn.* F. B. I. vii. 102; C. ii. 1051; Watt vi. pt. iv, 327; B. G. No. 23. Maize or Indian Corn. Vern. *Maka.*

Cultivated throughout the area for the grain, the unripe cobs being boiled or roasted.

The stems and leaves afford good fodder for cattle while the husked cobs finely ground form a valuable cattle food in conjunction with molasses.

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561. **Pollinia argentea,** *Trin.* F. B. I. vii. 111; C. ii. 950; B. G. No. 26, Fig. IX. Vern. *Gonchi, gaunchi* (Sau.; Dam.); *Marwel, belia marwel* (Ak.; Yeo.)

A tall slender tufted perennial grass, stems 2-4 ft. high, smooth, shining, leafy chiefly at the base. Leaves 6-18 in. long, very narrow, often filiform. Infl. of

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6-12 term., slightly spreading, flexuous, silky hairy, golden-brown, spike-like racemes, 2-6 in. long, with long awns becoming silvery and more hairy as they ripen.

Fls. *Oct.-Nov.*; fr. *Nov.-Dec.*

Common and frequently gregarious on black soil in open forest and uncultivated areas. A conspicuous grass probably found throughout the area, but I have only seen specimens from Sau.; Dam.; Ni.; Ak.; Yeo.

A good grass for grazing when young. It is eaten a good deal by buffaloes.

562. **Saccharum spontaneum**, *Linn.* F. B. I. vii. 118; C. ii. 948; Watt vi. pt. ii, 11; B. G. No. 28. Vern. *Kans* (Hin.—N.C.; B.C.); *Darbha* (Ak.).

A tall erect perennial grass, 2-5 ft. high. Leaves 1-2½ ft. very narrow, tapering to a fine point. In fl. a conspicuous term. silvery-white, silky panicle.

Fls. and fr. *Sep.-Oct.*

Common on black soil in cultivated fields where it is very harmful to crops. Also on low-lying waste land. Throughout the area.

It is eaten to a certain extent by cattle when young.

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563. **Saccharum officinarum**, *Linn.* F. B. I. vii. 118; C. ii. 948; Watt vi. pt. ii. 3; B. G. No. 27. The Sugar-cane. Vern. *Ganna*.

Cultivated here and there throughout the area.

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564. **Ischæmum rugosum**, *Salisb.* F. B. I. vii. 127; C. ii. 959; Watt iv. 531; B. G. No. 29, Fig. X. Vern. *Murdi* (Dam.; Seo.); *Bhador, bhadora* (Sau.; Seo.; Dam.); *Tudi jara* (Kur.—Mel.).

An annual grass; stems 1-3 ft. erect. Leaves 4-10 in. long, moderately narrow, the sheaths sometimes

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hirsute and eared at the top. Infl. usually of 2 erect racemes, 1-3 in. long, purplish-red when young, yellow when ripe, easily recognised by the corrugated outer glume, the upper portion glabrous.

Fls. and fr. *Oct.-Dec.*

In open low-lying wet ground, on black soil, and in cultivation. Sau.; Dam.; Seo. (in rice-fields); Hosh.; Ni.; Mel.

Of value for grazing. "The grain is eaten and it is a good fodder"—(Haines).

565. **Ischæmum angustifolium,** *Hack.* F. B. I. vii. 129; C. ii. 960.; Watt iv. 526; B. G. No. 30. Vern. *Bagai* (Mel.); *Babar* (Bet.; Seo.); *Sum* (Mar.—Seo.) The Baib grass of Bengal.

A perennial tufted grass, woolly at the base, 2-3 ft. high. Leaves 1-2 ft. long, very narrow, tapering to a fine point. Infl. of 2-4 golden or rusty villous spikes, 1-3 in. long, on ax. and term. slender peduncles.

Fls. *Dec.-Feb.*

Not common in this area. Bet.; Seo.; Mel.

This is not a fodder grass but is of importance on account of its value for paper-making, it being used extensively in Bengal for this purpose. Locally it is used for rope-making.

566. **Ischæmum pilosum,** *Hack.* F. B. I. vii. 130; C. ii. 961; Watt iv. 531; B. G. No. 31, Fig XI. Vern. *Kunda* (Seo.; Ni.; Ak.; Yeo.); *Kari* (Sau.).

Stems erect from an extensively creeping rooted base. Leaves 6-12 in. long, narrow, flat or convolute, glabrous. Infl. of 2-6 yellow or brownish term. spikes, clothed with soft fine white hairs, rendering the grass very conspicuous when in fl.

Fls. and fr. *Nov.-Dec.*

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Common on black soil, consequently frequently met with in fields. Seo.; Ni.; Ak.; Yeo., and probably throughout the area.

Of value as fodder as well as for grazing.

567. **Ischæmum sulcatum,** *Hack.* F. B. I. vii. 137; C. ii. 964; B. G. No. 32, Fig. XII. Vern. *Pawana, paona, poania* (Sau.; Ni.; Ak.; Yeo.); *Sainar, sada* (Mel.) *Chota paonia* (Ni.).

A rather short (1-2 ft.) slender, weak, much branched grass with numerous solitary, term., pale green or white spikes, 2-3 in. long, with long awns, the lower half brown and twisted, the upper half almost white. Leaves 4-8 in. long, narrow, ending in a very acuminate tip.

Fls. *Sep.-Oct.*; fr. *Nov.*

Fairly common in open grass lands on good soil, frequently gregarious. Sau.; Ak.; Yeo.; Mel.; Ni. but probably elsewhere. It is extremely common in the B. C. where it is one of the most valuable fodder grasses, especially in Ni.

568. **Ischæmum laxum,** *Br.* F. B. I. vii. 136; C. ii. 964; Watt iv. 531; B. G. No. 33. Vern. *Sainar, sain, sen* (Dam.; Sau.); *Shahala* (Berar); *Sairi, bara paonia* (Ni.).

A tall perennial tufted grass, 3-4 ft., very similar to preceding with which it is frequently confused, the same vernacular names being applied to both. Leaves longer than in preceding, the tips filiform. Infl. as in preceding, but may be distinguished by the exterior glume of the sessile spikelets being 6-nerved, whereas that of *I. sulcatum* is 2-nerved.

Fls. *Sep.-Oct.*; fr. *Nov.*

This undoubtedly occurs throughout the B. C. and probably in most of the N. C. Divisions also, but

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I have only seen specimens from Sau.; Dam.; Ak.; Yeo.; Ni. It occurs in similar localities to *I. sulcatum*. Its tufted growth is a very fair field character to distinguish it from the foregoing. The stems of both species become pale straw coloured when ripe and are then very conspicuous amongst other grasses.

Equally valuable with the preceding as a fodder grass expecially in the. B. C.

569. **Apluda varia**, *Hack.* F. B. I. vii. 150; C. ii. 956; B. G. No. 36, Fig. XV. Vern. *Bhajura* (Sau.; Dam.; Seo.); *Phulna* (Dam.); *Phulria, phuli, karmoria* (Ni.); *Polki* (Ak.); *Kadmor, gandhani* (Yeo.); *Phota, phula jara* (Mel.)

A tall perennial leafy grass. Stems 4-6 ft., densely tufted, much branched. Leaves 4-8 in. long, narrowed from the middle to a filiform tip, and below into a characteristic long or short slender petiole, slightly rough on both surfaces. Infl. of pale green or purplish spikelets, clustered on short peduncles, and enclosed in spathiform bracts, the clusters solitary or few or very numerous, and arranged in elongate interrupted leafy panicles.

Fls. *Oct.-Nov.*; fr. *Nov.-Dec.*

Essentially a forest grass, commonly found scrambling amongst bushes. It flourishes on poor soil and can stand a fair amount of shade. Sau.; Dam.; Seo.; Hosh.; Ak.; Yeo.; Mel.; Ni., but probably common throughout the area.

Opinions seem to differ as to its value for fodder, but it is frequently cut as such, and cattle readily graze on it.

570. **Rottbœlia perforata**, *Roxb.* F. B. I. vii. 158; B. G. No. 37, Fig. XVI. Vern. *Sontar, sontha* (Sau.; Dam.; Seo.; Hosh.); *Gunit* (Seo.); *Sontia* (Ni.); *Lahu* (Ak.); *Lawhali* (Yeo.).

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A rather slender sparingly branched grass; stems 2-4 ft. erect, soft and full of pith, leafy chiefly at the base. Leaves 6-24 in. (those on stem short) linear from a narrow base. Inflor. of ax. or laxly panicled, pale green, glabrous, jointed, cylindrical spikes, the spikelet sunk in the notches. When ripe the spikelets stand out at an angle from the rachis.

Fls. *Oct.-Nov.*; fr. *Nov.-Dec.*

A common grass in marshy water-logged localities. Sau.; Dam.; Seo.; Hosh.; Ak.; Yeo.; Ni. and no doubt throughout the area.

A grass to be avoided. It is of no value either as fodder or for grazing. It is sometimes used for thatching.

571. **Andropogon pertusus,** *Willd.* F. B. I. vii. 173; C. ii. 978; Watt i. 249; B. G. No. 41, Fig. XX.

Vern. *Kail, kela* (Dam.; Seo.; Hosh.; through confusion with A. annulatus, *Forsk.*); *Kailara, phulera* (?) (Sau.); *Malher* (Ak).; *Makhel* (Ni.).

A sparingly branched, generally erect, annual or perennial grass, 1-2 ft. high. Nodes bearded with spreading hairs. Leaves 2-12 in. long, narrowly linear, usually hairy. Inflor. of 3-8 almost erect, term., slender, purplish, silky hairy awned spikes, 1-2 in. long.

Fls. and fr. *Sep.-Nov.*

Common on all classes of soil, but specially light soils. Occurs in considerable quantities. Sau.; Dam.; Hosh.; Seo.; Ak.; Ni. and no doubt elsewhere.

It is very commonly confused by the native with *A. annulatus*, Forsk., to which it bears some superficial resemblance.

A valuable fodder grass well known in N. India as one of the species of "janewah."

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572. **Andropogon Sorghum.** *Brot.* (Syn. Sorghum vulgare, *Pers.*) F. B. I. vii. 183; C. ii. 991; Watt vi. pt. iii, 289; B. G. No. 45. Vern. *Juar*, *jowari* (N. C.; B. C.)

Extensively cultivated in both circles. The dry stalks (kharbi) are largely used as fodder in the B. C. though much less so in the N. C.

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573. **Andropogon squarrosus,** *Linn. f.* F. B. I. viii. 186; C. ii. 991; Watt i. 245; B. G. No. 48. Vern. *Khas*, *khus-khus* (Hin.—Hosh.; Bet.); *Urai* (Sau.; Dam.; Seo.).

A perennial grass, 3-5 ft. high, growing in large dense tufts, with stout spongy, aromatic roots. Characteristic are the narrow leaves, 1-2 ft. long, bifurcating some distance from the apex. Inflor. a large conical purplish panicle, 4-12 in. long, with many whorled ascending branches, each terminated by a many jointed spike.

Fls. and fr. *Nov.-Dec.*

On low-lying and marshy ground. Sau. (Jallandhar Res.); Dam.; Seo.; Hosh.; Bet.

Though not a fodder grass, it is of economic importance in the roots constituting the scented material from which khus-khus tatties are made.

574. **Andropogon monticola,** *Schult.* F. B. I. vii. 192; C. ii. 985; B. G. No. 49, Fig. XXIII Vern. *Gundli*, *tukka* (Dam.); *Kulha* (Seo.); *Gogad* (Ak.); *Sanikhidi* (Mel.); *Phulkia* (Ni.) (none of these names are reliable).

A very variable perennial grass; stems densely tufted, 1-4 ft. slender, erect, leafy chiefly at the base. Leaves 6-18 in. long, extremely narrow, glabrous. Inflor. a panicle, 2-6 in., with long capillary whorled branches, on the bearded tip of each branch being situated what looks like a solitary yellowish spikelet (actually 3 spikelets) with rufous hairs and a long awn.

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Fls. and fr. *Sep.-Nov.*

Common on open grass lands and 'birs,' chiefly on black cotton soil, associated with *Anthistiria ciliata*, *Pollinia argentea*, *Ischæmum laxum* and *sulctaum*. Sau. Dam.; Hosh.; Seo.; Ak.; Mel.; Ni.

Used as fodder when young and tender.

575. **Andropogon annulatus,** *Forsk.* F. B. I. vii. 196; C. ii. 988; B. G. No. 50, Fig. XXIV. Vern. *Kail* (Sau.; Dam.; Hosh.; Mel.; Ni.); *Machhari* (Mel.); *Belia marwel* (Ak.); *Guhar marwel* (Yeo.).

A perennial densely tufted grass; stems 2-3 ft. ascending from a creeping base, nodes usually bearded. Leaves 3-12 in. long, narrowly linear, running to a fine point, glabrous; sheaths bearded at the tip. Inflor. of 2-6 term. pinkish or nearly white awned spikes, 1-2½ in. long; awns light brown.

Fls. and fr. *Sep.-Nov.*

Common on the better class grass lands and 'birs'; partial to black soil. Associated with *Ischæmum laxum* and *sulcatum*, *Andropogon pertusus*, *Iseilma laxum*, *Andropogon contortus*. Sau.; Dam.; Hosh.; Seo.; Ak.; Yeo.; Mel.; Ni.; and probably in all Divisions.

An extremely good fodder grass, and though not actually gregarious it occurs in sufficient quantities to be of considerable value. Next to *Ischæmum laxum*, *I. sulcatum*, and *Iseilma laxum*, it is perhaps the most sought after fodder grass; in Ni. it is very highly thought of. It is well known in N. India under the name 'janewah' and highly valued.

With this species may be mentioned **Andropogon caricosus,** *Linn.* (B. G. No. 51) which is very similar, appears to give equally good fodder, and is classed by the natives with *A. annulatus* as 'kail.'

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576. **Andropogon contortus,** *Linn.* F. B. I. vii. 199; C. ii, 990; Watt i. 244; B. G No. 52. Vern. *Kusal, sukla* (B. C.; Seo.; Hosh.); *Kusli* (Ak.; Yeo.); *Sukli* (Ni.); *Parwa, parwaiya, lampa* (N. C.); *Sukal, lampa* (Bet.); *Sukra jara* (Gond.—Seo.); *Butoo jara, sagra jara, sona jara* (Kur.—Mel.); Spear grass.

A perennial leafy tufted grass, 1-4 ft. high, compressed below. Leaves 6-18 in. long, narrow, margins and upper surface scabrid. Spikes singly, 1½-3 in. long, greenish, ending in the twisted ends of the brown awns, which when ripe fall away with the barbed seed, well known by the discomfort caused to those who come in contact with it.

Fls. *Sep.-Nov.*; fr. *Nov.-Jan.*

Common throughout the area, usually gregarious, and on all kinds of soil; particularly luxuriant on black cotton soil.

A good fodder grass if cut before the seed has ripened. If cut later the seeds should be shaken out before feeding to cattle and horses as the seeds are apt to produce sore mouths.

Extensively used in this area owing to the quantities in which it occurs.

577. **Andropogon Schœnanthus,** *Linn.* F. B. I. vii. 204; C. ii. 991; Watt i. 249; B. G. No. 53, Fig. XXV. Vern. *Tikari, rusa* (N. C.; B. C.). Lemon-grass.

A tall very variable robust aromotic tufted grass, 3-6 ft. high. Leaves broad or narrow, acuminate, base cordate or amplexicaul. Inflor. an elongate compound lax panicle, 1-2 ft. long, reddish when ripe; spikes ½-¾ in. long, in pairs arising from spathes as long as or longer than the spikes.

Fls. and fr. *Nov.-Jan.*

Throughout the area, growing as a rule in isolated tufts amongst other grasses on rich soil, in hilly localities.

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Although not a fodder grass it is extremely valuable especially in the Berar Circle on account of the oil extracted from the inflorescence. There are two recognised varieties known as "Sophia" and "Motia"; the latter only being used for the extraction of oil. The grass is a valuable item of minor forest produce in Bet., Ni. and Mel. Extraction of the oil has also been tried in S. Man. and Sau. but apparently with no great success.

The grass is frequently used for thatching.

578. **Anthistiria ciliata**, *Linn. f.* F. B. I. vii. 213; C. ii. 994; B. G. No. 55, Fig. XXVI. Vern. *Gunaiya, gunhari, guniar* (N. C.); *Gondal, guniar*, (Ni.); *Ghonad, mota bondel* (Yeo.); *Gondali, gudsukud* (Mel); *Gondar* (Bet.).

Annual, stems tall, 4-5 ft., erect and seldom branched, rooting from the lower nodes. Leaves 6-10 in. long, narrow, glabrous or sparingly ciliate near the base. The inflor. occupies half or more of the stem and consists of branches either singly or in pairs arising from the axils of the leaves, and bearing along them dense clusters of awned spikelets arranged alternately. These clusters are subtended by numerous leaf-like spathes clothed with conspicuous tubercle based hairs.

Fls. and fr. *Oct.-Dec.*; the inflor. turns a rich red-brown when ripe.

Common throughout the area. Frequently gregarious in large masses in forest and village lands on rich soil.

A good fooder when cut young and green. It is used considerably in this area although it is usually cut too late. The Military Grass Farms use it mainly for bedding, but as such it is frequently eaten by the horses.

NOTE.—The following three species have been badly mixed up in the past, but more especially *I.*

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anthephoroides, Hack., and *I. laxum*, Hack. When preparing my list of Berar grasses all specimens of *I. anthephoroides* and *I. laxum* were identified by the Curator of the Botanic Gardens, Calcutta, and by the Imperial Forest Botanist, Dehra Dun, as *I. laxum*. In the field however it was clear that two different species were under consideration. Mr. R. S. Hole, Imperial Forest Botanist, has since had living specimens under his observation, and has now identified the species described by me under serial No. 57 (Fig. XXVII) of the above-mentioned list as *I. anthephoroides*, Hack., while No. 59 (Fig. XXVII-A) becomes *I. laxum*, Hack., and is the typical form in this area, although according to the authorities consulted it differs from the type.

Similarly there was confusion with *I. Wightii*, but recent specimens found in considerable quantity in Sau. have established the fact that this grass has a pungent unpleasant scent and is quite unsuited for fodder.

It would appear from the descriptions in his Southern Circle list (*Indian Forester*, Vol. XL, No. 10), that Mr. Haines has also mixed up these three species for part of his description of *I. laxum* applies to *I. anthephoroides*, and he further notes that two forms of *I. laxum* occur. *I. Wightii* is at the same time stated to be "an excellent fodder" which does not agree with my recent observations.

579. **Iseilma anthephoroides**, *Hack.* F B. I. vii. 219; B. G. No. 57, Fig. XXVII. (Incorrectly named I. laxum, *Hack.*) Vern. *Masuri*, *musyal* (Ni.); *Gadru*, *garar musyal* (Sau.); *Musar* (Yeo.).

A tufted, comparatively short, perennial grass. Stems erect, from a creeping rooted base, seldom over 2 ft. high, usually red Leaves 3-6 in. long, narrow, obtuse to acute, strongly keeled, base ciliate. Inflor. of several

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lax moderately distant short panicles, consisting of flattened leaf sheaths and their blades, bearing fascicles of small peduncled spikes enclosed in boat-shaped reddish spathes, the whole forming a flexuous compound panicle ; spathes sparingly ciliate with smooth keels.

Fls. and fr. *Oct.-Dec.*

Common on all but the poorest soils, but partial to moist water-logged localities and black cotton soil. Frequently gregarious. Ni. ; Sau. ; Ak. ; Yeo. ; Mel. There is, however, no doubt that this occurs elsewhere in this area, probably in all Divisions, but it has been so mixed up with *I. laxum*, Hack., that fresh specimens are required to determine its distribution.

A very good fodder, and so far as my experience goes not readily distinguished by natives from its close ally *I. laxum*. It being as a rule so much shorter than *I. laxum*, it is not cut perhaps quite so much for fodder, but it is readily grazed.

The two species are frequently found growing together.

580. **Iseilma laxum**, *Hack.* F. B. I. vii. 218 ; C. ii. 996 ; Watt iv. 524 ; B. G. No. 59, Fig. XXVII-A. Vern. *Musyal*, *musel* (Sau. ; Dam. ; Seo. ; Ni.) ; *Muchel* (Seo.—Hosh.) ; *Masuri* (Ni.) ; *Mushan* (Seo. ; Berar).

Perennial, stems 2—3 ft. very slender, erect, generally green, sometimes reddish, simple or sparingly branched. Leaves 4-8 in. long, narrow, acute to acuminate, glabrous. Inflor. similar in character to that of preceding but longer, narrower, strict (not flexuous) and less leafy, panicles long or short, distant, the spikelets fascicled in linear-lanceolate glabrous green spathes A variable species ; some specimens have red stems and reddish spathes, and are then easily confused with *I. anthephoroides*.

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The tufted and more branched character of *I. anthephoroides* will usually simplify identification in the field.

Fls. and fr. *Oct.-Dec.*

Common; almost always found on heavy black soil, especially where the soil is water-logged, and where water accumulates and lies during the rains, such as in borrow-pits along roads and railway lines. Frequently in gregarious masses. Sau.; Dam.; Seo.; Hosh.; Ni.; Ak.; Yeo.; Mel. and no doubt throughout the area, but here again fresh specimens are required to determine the distribution and separate it from *I. anthephoroides*.

This is the typical "musel" grass of the native and is looked on as one of the very best fodder grasses.

581. **Iseilma Wightii**, *Anders.* F. B. I. vii. 218; C. ii. 966; Watt iv. 524; B. G. No. 58. Vern. *Ukri* (Sau.; Dam.; Seo.); *Ghania* (Ni.); *Mushad* (Yeo.).

A tufted strongly scented perennial grass, 3-4 ft. high, stems usually erect, rather slender; nodes often bearded. Leaves 4-8 in. long, narrow, scaberulous, frequently very hairy, especially the sheath. Inflor. similar in character to the two preceding species, but the panicle is more spreading and copiously branched. The proper spathes are linear-lanceolate, not boat-shaped as those of *I. anthephoroides*, and are green. The floral leaves and spathes are characteristically furnished along the margins and keels with rows of tubercles, and are frequently very hairy.

On heavy and light soils, but mainly confined to low-lying patches of black cotton soil, where it is usually gregarious. Not so frequent as either of the two preceding species. Sau. (Jallandhar Res.); Dam.; Seo.; Yeo.; Ni.

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Not eaten by cattle, and useless for fodder on account of the pungent and unpleasant scent especially when green. Haines in his list of the Southern Circle does not mention this characteristic which I have myself only recently definitely determined. On the contrary he says "an excellent fodder." The confusion between these three species has been widespread.

582. **Cynodon dactylon,** *Pers.* F. B. I. vii. 288; C. ii. 1032; Watt ii. 678; B. G. No. 65. Vern. *Hariali, dub* (N. C.; B. C.).

A prostrate widely creeping grass, with short ascending branches. Leaves short, glaucous. Inflor. of 2-5 term. green or purplish radiating spikes, 1-2 in. long. Along nalas and in moist places on sandy loam. In all Divisions.

An excellent fodder and frequently used for horses; owing to its small size it is not suitable to cut as fodder for cattle. It is commonly used for the turf of lawns and polo grounds, etc.

583. **Eleusine ægyptiaca,** *Desf.* F. B. I. vii. 295; C. ii. 1038; Watt iii. 236; B. G. No. 69, Fig. XXXIII. Vern. *Kakdel, mandi* (Yeo.); *Kada jara* (Mel.); *Kharmakri* (Bet.); *Kakria, phanihad* (Ni.); *Kandi madgi* (Hosh.); *Ran madiya* (Seo.). [Vern. names unreliable.]

A small annual grass, 6-18 in. high; stems at first prostrate, then erect, much branched and rooting from the nodes. Leaves 1-5 in. long, narrow, glabrous or hairy. Inflor. of 2-5 term. almost erect, digitate spikes, ¾-1½ in. long; spikelets 2-3 seriate, secund, spreading at right angles to the rachis, ⅛ in. long.

Common on low dry stony hills and generally on shallow soil. Sau.; Hosh.; Seo.; Yeo.; Mel.; Bet.; Ni.

Said to be amongst the best of the annual grasses for fodder and grazing.

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584. **Bambusa arundinacea,** *Willd.* F. B. I. vii. 395 ; Br. 671 ; G. 748 ; C. ii 1046 ; Watt i. 390 ; B. G. No. 79. Vern. *Katany bans* (Hin.—N. C. ; B. C.).

A large densely tufted bamboo ; culms 30-50 ft. bearing on the lower nodes horizontal almost leafless branches, armed with stout recurved spines.

Fls. periodically at long intervals ; on the Nerbudda river near Jab. 1839 ; at Jabalpur 1870. (Brandis) ; Sau. 1915.

Along the banks of streams, but not common. Wild in Jub. ; S. Man. (Jagmandal R.) ; Hosh. ; Seo. ; Bet. It is however frequently planted in moist localities, along roads, and in many Civil stations, such as Jub. ; Sau.

585. **Dendrocalamus strictus,** *Nees.* F. B. I. vii. 404 ; Br. 675 ; G. 751 ; C. ii 1049 ; Watt iii. 72 ; B. G. No. 80. Vern. *Bans* (Hin.—N. C. ; B. C.) ; *Uhadur, waddur* (Gond.—Jub. ; Seo.). Male bamboo.

A middle-sized tufted bamboo ; culms 20-35. ft.

Fls. here and there every year and periodically gregariously over large areas. Fls. *Dec.-Feb.* ; fr. *Apr.-May* ; leaves fall, *Jan.-Feb* ; leaves renewed, *June.*

Common throughout the area along nalas in valleys, and on hill slopes in the better class forests. On dry shallow soil the culms are frequently solid throughout, while on rich soil with plenty of moisture the culms are hollow.

Extensively used for building, basket and mat work, agricultural and industrial implements, etc.

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SYLVICULTURAL AND ŒCOLOGICAL LISTS.

Lists of the principal species arranged in order of merit according to their relative capacity to—

A.—Endure shade.

I. Shade bearers.

Casearia tomentosa.
Do. graveolens.
Cleistanthus collinus.
Holarrhena antidysenterica.
Antidesma diandrum.
Saccopetalum tomentosum.
Schleichera trijuga.
Gardenia latifolia.
Kydia calycina.
Shorea robusta.
Elæodendron glaucum.
Semicarpus Anacardium.
Stereospermum chelonoides.
Grewia tiliæfolia.
Adina cordifolia.

II. Partial shade bearers.

Pterocarpus Marsupium.
Diospyros melanoxylon.
Stephygne parvifolia.
Terminalia tomentosa.
Do. belerica.
Hardwickia binata.
Lagerstrœmia parviflora.
Stereospermum suaveolens.

III.. Light demanders.

Santalum album.
Acacia leucophlœa.
Anogeissus latifolia.
Soymida febrifuga.
Phyllanthus emblica.
Dolicandrone falcata.
Schrebera swietenioides.
Bassia latifolia.
Terminalia chebula.
Tectona grandis.
Dalbergia latifolia.
Do. Sissoo.
Acacia Catechu.
Do arabica.
Chloroxylon Swietenia.
Odina Wodier.
Boswellia serrata.

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B.—Resist frost.

I. Frost hardy.

Zizyphus Jujuba.
Acacia Catechu.
Do. leucophlœa.
Gardenia turgida.
Chloroxylon Swietenia.
Aegle Marmelos.
Elæodendron glaucum.
Gymnosporia montana.
Hardwickia binata.
Carissa spinarum.
Stereospermum suaveolens.
Vitex Negundo.

II. Less hardy.

Terminalia tomentosa.
Do. Arjuna.
Do. Chebula
Ougeinia dalbergioides.
Woodfordia floribunda.
Mallotus philippinensis.
Ficus glomerata.
Mangifera indica.
Butea frondosa,
Anogeissus latifolia.

III. Frost tender.

Shorea robusta.
Grewia Rothii.
Zizyphus Œnoplia.
Do. xylopyra.
Nyctanthes Arbor-tristis.
Bridelia retusa.
Boswellia serrata.
Lagerstrœmia parviflora.
Ficus bengalensis.
Holarrhena antidysenterica.
Terminalia belerica.
Miliusa velutina.
Schrebera swietenioides.
Tectona grandis.
Diospyros melanoxylon.
Bauhinia racemosa.
Phyllanthus emblica.
Buchanania latifolia.
Flacourtia Ramontchi.
Odina Wodier.
Dalbergia paniculata.
Helicteres Isora.
Bassia latifolia.

C.—Coppice strongly.

I. Coppice strongly.

Tectona grandis.
Terminalia tomentosa.
Cleistanthus collinus.
Diospyros melanoxylon.
Zizyphus Jujuba.
Lagerstrœmia parviflora.
Butea frondosa.
Phyllanthus emblica.
Kydia calycina.
Anogeissus latifolia.
Grewia tiliæfolia.

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C.—Coppice strongly—(concld.).

Gmelina arborea.
Albizzia procera.
Holarrhena antidysenterica.
Dalbergia Sissoo.
Cassia Fistula.
Acacia Catechu.
Cordia Macleodii.
Dalbergia latifolia.
Ehretia lævis.
Shorea robusta.
Sterculia villosa.

II. Coppice moderately.

Pterocarpus Marsupium.
Chloroxylon Swietenia.
Elæodendron glaucum.
Bauhinia malabarica.
Do. racemosa.
Aegle Marmelos.
Soymida febrifuga.
Garuga pinnata.
Acacia leucophlœa.
Gardenia latifolia.
Do. turgida.
Schrebera swietenioides.
Stereospermum suaveolens.
Bridelia retusa.
Boswellia serrata.

III. Coppice badly.

Acacia arabica.
Adina cordifolia.
Stephygne parvifolia.
Bassia latifolia.
Odina Wodier.
Ougeinia dalbergioides.
Terminalia belerica.
Cochlospermum Gossypium.
Bombax malabaricum.
Sterculia urens.

D.—Reproduce by root-suckers.

Diospyros melanoxylon.
Dalbergia Sissoo.
Ougeinia dalbergioides.
Stereospermum chelonoides.
Millingtonia hortensis.

E.—Thrive in very dry localities, e.g., bare rocky slopes, plateaux and very dry soil

I. Thrive on bare rocky slopes and plateaux.

Euphorbia Nivulia.
Cochlospermum Gossypium.
Boswellia serrata.
Sterculia urens.
Dolicandrone falcata.
Gardenia turgida.
Hamiltonia suaveolens.
Calophanes Dalzellii.

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E.—Thrive in very dry localities, e.g., bare rocky slopes, plateaux and very dry soil—(concld.)

Waltheria indica.
Ficus tomentosa.
Do. Arnottiana.

II. Thrive on dry shallow rocky soil.

Balsamodendron Mukul.
Acacia Catechu.
Prosopis spicigera.
Dichrostachys cinera.
Chloroxylon Swietenia.
Soymida febrifuga.
Zizyphus xylopyra.
Odina Wodier.
Wrightia tinctoria.
Bauhinia racemosa.
Diospyros melanoxylon.
Lagerstrœmia parviflora.
Buchanania latifolia.
Anogeissus pendula.
Acacia sp. Nov.
Nyctanthes Arbor-tristis.
Melhania Hamiltoniana.
Dodonœa viscosa.
Cassia auriculata.
Woodfordia floribunda.

F.—Thrive on low-lying, water-logged soil.

Randia uliginosa.
Barringtonia acutangula.
Phyllanthus reticulatus.
Trewia nudiflora.
Acacia arabica.
Sesbania aculeata.
Jussiæa suffruticosa.
Polygonum glabrum.
Salix tetrasperma.
Cassia Tora.
Cassia siamea.
Lea macrophylla.
Balanites Roxburghii.
Dillenia pentagyna.
Mallotus philippinensis.
Terminalia tomentosa.
Albizzia procera.
Butea frondosa.

G.—Thrive on landslips and shifting sands.

Trema orientalis.
Do. politoria.
Vitex Negundo.
Wendlandia exserta.
Calotropis gigantea.
Ougeinia dalbergioides.
Buchanania latifolia.
Cassia auriculata.

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H.—Grow rapidly during youth.

Kydia calycina.
Sesbania ægyptiaca.
Do. grandiflora.
Erythrina suberosa.
Tectona grandis.
Acacia arabica.
Millingtonia hortensis.
Oroxylum indicum.
Sterculia villosa.
Dillenia pentagyna.
Mangifera indica.
Jatropha Curcas.
Salix tetrasperma.
Bombax malabaricum.
Albizzia Lebbek.
Do. procera.
Terminalia belerica.
Grewia tiliæfolia.
Adina cordifolia.

J.—Resist drought.

(List prepared by Mr. R. S. Troup, Forest Bulletin No. 22 of 1913.)

I. Very hardy.

Ficus religiosa.
Do. bengalensis.
Diospyros melanoxylon.
Stereospermum suaveolens.
Miliusa velutina.

II. Decidedly hardy.

Gardenia turgida.
Schleichera trijuga.
Holarrhena antidysenterica.
Ougeinia dalbergioides.
Cassia Fistula.
Cordia Myxa.
Bauhinia racemosa.
Casearia tomentosa.
Butea frondosa.
Bridelia retusa.
Odina Wodier.
Eugenia Jambolana.
Ehretia lævis.
Mallotus philippinensis.
Carissa spinarum.
Lagerstrœmia parviflora.
Careya arborea.
Kydia calycina.
Randia uliginosa.
Do. dumetorum.
Zizyphus xylopyra.
Aegle Marmelos.

III. Fairly hardy.

Adina cordifolia.
Stephegyne parvifolia.
Terminalia belerica.
Wrightia tomentosa.
Albizzia procera.

IV. Drought-tender.

Shorea robusta.
Terminalia tomentosa.
Mangifera indica.
Bassia latifolia.
Anogeissus latifolia.

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GLOSSARY.

Accrescent.—Increasing in size with age.
Achene.—A small dry, hard, one-celled, one-seeded, indehiscent fruit.
Acute.—Ending in an acute angle ; with reference to the extremity of a leaf.
Acuminate.—Ending in a tapering point.
Amplexicaul.—Clasping a stem.
Annual.—Of only one year's duration.
Apiculate.—Ending in a short-pointed tip.
Appressed.—Lying flat against for the whole length.
Aril.—An extraneous seed coat or an appendage growing about a seed.
Auricle.—An ear-shaped appendage.
Awn.—A bristle-shaped appendage.
Axil.—The angle formed on the upper side of the attachment of a leaf with the stem.
Axillary.—In or relating to an axil.
Bearded.—Beset with long fine hairs.
Bract.—The leaves of a flower-cluster.
Bracteate.—Having bracts.
Caducous.—Dropping off very early.
Calyx.—The exterior envelope of a flower.
Capsule.—A dry and dehiscent fruit composed of more than one carpel.
Carpel.—The female organ of a flower.
Caudate.—Furnished with a tail or appendage resembling a tail.
Cilia.—Marginal hairs forming a fringe, like the eyelash.
Ciliate.—Marginally fringed with hairs.
Clavate.—Club-shaped.

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Cocci.—The portions into which a lobed fr. with one-seeded cells, split up

Convolute.—Rolled up from the sides or longitudinally.

Cordate.—Heart-shaped, like the figure of a heart on cards.

Coriaceous.—Leathery in consistence.

Corolla.—The interior envelope of a flower.

Corona.—An inner appendage to a petal or to the throat of a corolla.

Corymb.—A flat topped or merely convex and open flower-cluster.

Corymbose.—In corymbs or in the manner of a corymb.

Crenate.—Toothed, but with the teeth much rounded.

Crenulate.—The diminutive of crenate.

Crustaceous.—Of hard and brittle texture.

Cuneate.—Wedge-shaped.

Cyme.—A fl. cluster which has developed centrifugally, usually broad and flattish.

Cystoliths.—Crystalline concretions of the cells in the epidermis of a leaf.

Decumbent.—Reclining, but with the apex ascending.

Deciduous.—Falling in season as leaves in autumn.

Decussate.—In pairs alternately crossing at right angles.

Deltoid.—Having the shape of the Greak letter Δ.

Digitate.—Of compound leaves, in which all the leaflets are borne on the summit of the petiole.

Distichous.—Disposed in two vertical ranks.

Divaricate.—Inclining directly away from each other.

Drupe.—A fleshy fruit with a single stone centre.

Echinate.—Beset with prickles like a hedge-hog.

Ellipsoid.—An elliptical shaped solid; used with reference to the shape of a fruit.

Elliptic.—In the form of an ellipse.

Emarginate.—With a notch cut out of the extremity.

Exfoliating.—The process of shedding of the bark of a tree.

Exstipellate.—Destitute of stipels.

Falcate.—Scythe-shaped or sickle-shaped.

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Fascicle.—A close cluster or bundle either of flowers or leaves.

Ferrugineous.—Coloured to imitate iron-rust.

Filiform.—Thread-shaped, long and slender.

Flexuous.—Zig-zag, bent alternately in opposite directions.

Follicle.—Fruit of a single carpel dehiscing (opening) by one (the central, *i.e.*, inner) suture.

Fulvous.—Tawny, orange yellow and grey mixed.

Fusiform.—Spindle-shaped, tapering gradually to each end.

Glabrous.—Smooth in the sense of not hairy.

Glabrescent.—Almost but not quite glabrous.

Gland.—A definite secreting surface or structure on the surface of any part of a plant, extended to any protuberance or structure of similar nature which may not secrete.

Glaucous.—Covered or whitened with a bloom.

Globose.—Having or approaching a spherical form.

Glume.—One of the chaff-like bracts of the inflorescence of grasses.

Gynophore.—The stalk-like support of a carpel.

Hirsute.—Hairy with rather coarse or stiff hairs.

Hispid.—Beset with rigid or bristly hairs.

Head.—A cluster of sessile flowers on a very short axis.

Inciso-serrate.—Beset with small sharp teeth and also irregular more or less deep incisions.

Imparipinnate.—A pinnate leaf with an odd terminal leaflet.

Inflorescence.—A flower-cluster.

Involucre.—A circle of bracts subtending a flower-cluster.

Involucral.—Of or relating to an involucre.

Keel.—A central dorsel ridge like the keel of a boat.

Laciniate.—Slashed ; cut into narrow incisions.

Lanceolate.—Shaped like a lance-head, narrower than oblong and tapering towards the apex.

Lax.—Loose.

Linear.—Several times longer than wide and the margins parallel.

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Moniliform.—Necklace-shaped; cylindrical and with contractions at intervals.

Mucronate.—With a short and abrupt tip to a leaf.

Multisect.—Cleft into many lobes or segments.

Muricate.—Rough with short and firm excrescences.

Node.—The portion of a stem which normally bears a leaf or whorl of leaves.

Oblong.—About twice or thrice as long as broad and with nearly parallel sides.

Obovate.—Egg-shaped with the broader end towards the apex.

Oblanceolate.—Lanceolate, but tapering towards the base and not towards the apex.

Obtuse.—Blunt or rounded at the extremity.

Orbicular.—Circular in outline or nearly so.

Ovate.—Of the shape of the longitudinal section of a hen's egg, the broader end basal.

Ovoid.—Used for solid ovate (egg-shaped).

Palmate.—Of leaves, divided or lobed like a hand or webbed foot.

Panicle.—A loose compound flower-cluster such as is produced by the branching of a raceme.

Pappus.—The hairy tufts on achenes or fruits.

Paripinnate.—Even-pinnate.

Pedicle.—The support or stalk of a single flower.

Peduncle.—A general flower stalk supporting a cluster of flowers.

Perennial.—Lasting year after year, as opposed to annual.

Petiole.—The stalk of a leaf.

Pinna.—A primary division of a pinnate leaf, either simply pinnate when it is a leaflet, or a partial petiole or rachis with the leaflets, when the leaf is bi-pinnate.

Pinnate.—When leaflets are arranged along each side of a common petiole.

Pinnatifid—Pinnately cleft.

Pubescence.—Soft or downy and short hairs.

Pubescent.—Clothed or furnished with soft downy and short hairs.

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Pyriform.—Pear-shaped.

Raceme.—A form of inflorescence consisting of a lengthened axis set at more or less equal intervals with equal pedicelled flowers.

Racemose.—Having the character or appearance of a raceme.

Rachis.—The main axis of an inflorescence or a compound leaf.

Reniform —Kidney-shaped.

Repand.—With slightly uneven margin.

Rotundate.—Circular in outline.

Samara.—An indehiscent winged fruit.

Sarmentose.—Producing long and lithe branches.

Secondary-nerves.—The nerves (usually conspicuous) starting from the midrib of a leaf.

Secund.—When parts or organs are all directed to one side.

Serrate.—Beset with teeth like a saw.

Serrulate.—Serrate with very small or fine teeth.

Sessile.—Destitute of a stalk, whether peduncle or petiole.

Sheath.—The tubular or enrolled lower portion of a leaf in grasses.

Sinuate.—With a strongly wavy or recessed margin.

Spathe.—A large bract enclosing a flower-cluster.

Spike.—A form of inflorescence with the flowers set close together and close on to a lengthened axis.

Spikelet.—A secondary spike; the name given to the cluster of one or more flowers of grasses subtended by a common pair of glumes.

Stipule.—Appendages of a leaf, set one on each side of the insertion of the leaf with the stem.

Strigose.—Beset with sharp-pointed and appressed straight and stiff hairs.

Suture.—A junction or seam of union; commonly used for the line of opening of a pod.

Ternate.—In threes.

Tomentose.—Densely hairy with matted wool or tomentum.

Torulose.—Almost cylindrical with contractions or bulges at intervals.

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Torus.—The receptacle or axis on which all the parts of a flower are inserted.

Trichotomous.—Three-forked ; branched into three divisions.

Trifoliolate.—Of three leaflets.

Trigonous.—Three-angled.

Truncate.—As if cut off at the end.

Tubercle.—A small excrescence.

Umbel.—An inflorescence in which a cluster of pedicels spring all from the same point like rays of an umbrella.

Umbellate.—In or like umbels.

Villous.—Bearing shaggy or long and soft hairs.

Viscid.—Sticky from a tenacious secretion.

Whorl.—Arranged in a circle round an axis.

Zygomorphic.—Used of flowers which can be bisected in only one plane into similar halves.

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ADDENDA TO GLOSSARY.

Adnate.—Congenitally united to; as the calyx-tube to the ovary in many species.

Anther.—The polliniferous part of a stamen.

Campanulate.—Bell-shaped; used with reference to the shape of corollas.

Cauline.—Belonging to the stem.

Circinnate.—Rolled inwards from the tip into a coil.

Dentate.—Toothed; relating to the margin of a leaf.

Denticulate.—Minutely toothed.

Dichotamous.—Forked in pairs.

Diœcious.—Unisexual, and the two sexes borne by distinct individuals.

Hastate.—Halberd-shaped.

Hypogynous.—Applied to petals and stamens when they or the disk that bears them are entirely free from the calyx and ovary. The ovary is then described as superior.

Imbricate.—Overlapping; applied to sepals or petals.

Peltate.—Shield-form; applied to leaves which are attached to the petiole by some part of the lower surface, instead of the basal margin.

Perianth.—The floral envelopes of the flower consisting of calyx, corolla or both.

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Placenta.—The part in the ovary which bears the ovules.

Radical.—Belonging to or proceeding from the root.

Rotate.—Wheel-shaped ; circular and horizontally spreading very flat. Used with reference to the shape of corollas.

Scabrid.—Rough to the touch.

Scarious.—Thin, dry, membranaceous, and not green.

Stamen.—The male or fertilising organ of a flower.

Staminode.—A sterile stamen without anther.

Stellate.—Star-shaped ; applied to branched hairs on a leaf, if several branches radiate horizontally.

Stipel.—An appendage to a leaflet, analagous to the stipule of a leaf.

Striate.—Marked with fine longitudinal lines, or diminutive grooves or ridges.

Subulate.—Awl-shaped.

Terete.—Round in the sense of having a circular transverse section ; commonly applied to stems.

Triquetrous.—Three-edged ; with three salient angles.

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ABBREVIATIONS.

Alt.	= Alternate.
Ax.	= Axillary.
Fem.	= Female.
Fls.	= Flowers.
Fr.	= Fruit.
H. S.	= Hot season.
Infl.	= Inflorescence.
Opp.	= Opposite.
Pr.	= Pair.
R.	= Range.
Res.	= Reserve.
Sec.	= Secondary.
Sim.	= Simple.
Term.	= Terminal.
♂	= Male.
♀	= Female.
Br.	= "Indian Trees" by Sir D. Brandis.
B. G.	= Forest Flora of Berar Circle, Pt. II—Grasses.
C.	= Flora of the Bombay Presidency by T. Cooke.
F. B. I.	= Flora of British India by Sir J. D. Hooker.
G.	= "Indian Timbers" by J. S. Gamble.
Watt	= Dictionary of Economic Products by Dr. Watt.

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Gond.	= Gondi.		
Hin.	= Hindi.		
Kur.	= Kurku.		
Mar.	= Marathi.		
B. C.	= Berar Circle.		
N. C.	= Northern Circle.		
Chin.	= Chindwara Forest Division ..		Northern Circle.
Dam	= Damoh ,, ,, ..		
Hosh.	= Hoshangabad ,, ,, ..		
Jub.	= Jubbulpore-Narsinghpur Forest Division		
N. Man.	= North Mandla Forest Division ..		
S. Man.	= South-Mandla ,, ,, ..		
Sau.	= Saugor ,, ,, ..		
Seo.	= Seoni ,, ,, ..		
Ak.	= Akola ,, ,, ..		Berar Circle.
Am.	= Amraoti ,, ,, ..		
Bul.	= Buldana ,, ,, ..		
Bet.	= Betul ,, ,, ..		
Mel.	= Melghat ,, ,, ..		
Ni.	= Nimar ,, ,, ..		
Yeo.	= Yeotmal ,, ,, ..		

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ADDENDA.

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7. **Michelia Champaca.** Common in Handikho ravine, Pachmarhi, Hosh.
12. **Tinospora cordifolia.** Vern. *Gulvel* (Mar.-Bul.).
14. **Cissampelos Pareira.** Bul.
21. **Capparis zeylanica.** Vern. *Pachara* (Mar.-Bul.).
26. **Capparis horrida.** Common throughout the area.
42. **Abutilon indicum.** Bul.
61. **Sterculia villosa.** Hosh. (Big Falls, Pachmarhi).
76. **Grewia abutifolia.** Vern. *Dhaman* (Hin.-Bul.)
34. **Hiptage Madablota.** Bul.
90. **Citrus medica.** Hosh. (Jambudhip ravine, Pachmarhi).
102. **Balsamodendron Mukul.** Bul.
128. **Leea macrophylla.** Vern. *Hathikand* Mar.-Bul.).
129. **Leea aspera.** Vern. *Kuram* Mar.-Bul.).
132. **Sapindus laurifolius.** Bul.
135. **Rhus parviflora.** Leaves renewed *May-June.*
150. **Indigofera tinctoria.** Vern. *Nil.* (Hin.-Bul.)
156. **Tephrosia purpurea.** Vern. *Unali* (Mar.-Bul.).
169. **Desmodium latifolium.** Bul.
170. **Desmodium gyrans.** New shoots *May-June.* Hosh. (Big Falls, Pachmarhi).
181. **Pueraria tuberosa.** Vern. *Bhuikauala* (Mar.-Bul.).
190. **Atylosia scarabaeoides.** Bul.
210. **Sophora interrupta.** Leaves renewed *June.*
217. **Cassia occidentalis.** Vern. *Tarwad* (Mar.-Bul.).
218. **Cassia Sophera.** Vern. *Tarwad* (Mar.-Bul.).
220. **Cassia obtusifolia.** Vern. *Chokaor* (Mar.-Bul.)
221. **Cassia auriculata.** Bul.
229. **Bauhinia racemosa.** Vern. *Abeta* (Mar.-Bul.).
230. **Bauhinia malabarica.** Vern. *Amta* (Hin.-Bul.).
232. **Bauhinia Vahlii.** Vern. *Maljan* (Mar.-Bul.).
234. **Bauhinia variegata.** Vern. *Kachnar* (Hin.-Bul.).
244. **Mimosa pudica.** Vern. *Lajalu* (Mar.-Bul.).
254. **Acacia caesia.** Hosh. (Pachmarhi Hills, common).
275. **Combretum ovalifolium.** Vern. *Rahatvel* (Mar.-Bul.)
298. **Luffa acutangula.** Vern. *Jangli dodka* (Mar.-Bul.).
301. **Momordica diica.** Vern. *Kartule* (Mar.-Bul.).

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302. **Momordica Cymbalaria.** Vern. *Kartule* (Mar.-Bul.).
306. **Coccinia indica.** Vern. *Indravan* (Mar.-Bul.).
312. **Alangium Lamarckii.** Bul.
316. **Hymenodictyon excelsum.** Hosh. (Pachmarhi Hills).
322. **Randia uliginosa.** Vern. *Tupkela* (Mar.-Bul.).
342. **Jasminum arborescens.** Hosh. (Pachmarhi, common). Vern. *Chameli* (Hin.-Bul.).
346. **Nyctanthes arbor-tristis.** Vern. *Parijatak* (Mar.-Bul.).
348. **Salvadora persica.** Vern. *Pilukatar* (Mar.-Bul.).
350. **Carissa Carandas.** Bul.
353. **Wrightia tomentosa.** Vern. *Dudhi* (Mar.-Bul.).
356. **Ichnocarpus frutescens.** Hosh. (Pachmarhi, common).
363. **Hemidesmus indicus.** Vern. *Anantvel* (Mar.-Bul.).
367. **Daemia extensa.** Vern. *Dudhi* (Hin.-Bul.).
377. **Strychnos potatorum.** Vern. *Nirmali* (Mar.-Bul.)
406. **Cuscuta reflexea.** Vern. *Amarvel* (Mar.-Bul.).
407. **Solanum indicum.** Hosh. (Jambudhip ravine, Pachmarhi). Stout shrub 3′—6′ high.
422. **Hygrophila spinosa.** Vern. *Untkatara* (Hin.-Bul.).
434. **Barleria Prionitis.** Vern. *Kata karota* (Mar.-Bul.).
437. **Barleria cristata.** Vern. *Karota* (Mar.-Bul.).
440. **Adhatoda vasica.** Bul.
464. **Colebrookia oppositifolia.** Vern. *Bandar* (Mar.-Bul.).
465. **Achyranthes aspera.** Bul.
473. **Loranthus longiflorus.** Vern. *Kawri* (Mar.-Bul.).
487. **Fluggea Leucopyrus.** Leaves renewed *June.*
491. **Antidesma diandrum.** Hosh. (Jambudhip ravine, Pachmarhi).
492. **Jatropha Curcas.** Vern. *Irand* (Mar.-Bul.).
509a. **Ficus cupulata,** *Haines.*
A middle-sized spreading tree. L. ovate-cordate, 3″—5″ long, shortly acuminate, gl. above, faintly pubescent beneath. Basal nerves 3. Sec. nerves 4—6 prs. joined by an intramarginal nerve. Fr. $\frac{1}{8}$″—$\frac{1}{4}$″ diam. white, sessile, ax. and above the scars of fallen leaves. Petiole 1″—2″ long.
Fls. and fr. *May-June.*
Common on rocks on the Pachmarhi plateau, Hosh. This species has been identified as the above by Mr. R. S. Hole, Forest Botanist.
513. **Ficus retusa.** Vern. *Paraspipal* (Mar.-Bul.).
515. **Ficus Arnottiana.** Hosh. (Pachmarhi, on rocks). Leaves renewed *May-June.*
523. **Boehmeria platyphylla.** Hosh. (Jambudhip, Bee Falls and other ravines round Pachmarhi).
531. **Musa superba.** Hosh. (Big Falls, Pachmarhi). Bul.
543. **Asparagus racemosus.** Vern. *Sarasmuli* (Hin., Mar.-Bul.).
545. **Phoenix acaulis.** Vern. *Choti sindi* (Mar.-Bul.).

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